SNS 102030000-ES0007-R08

Oak Ridge National Laboratory/ Chestnut Ridge Facilities Project Safety and Health Plan

September 2020

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ORNL/CRF PROJECT
SAFETY AND HEALTH PLAN

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U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-00OR22725

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1. SAFETY POLICY

The safety of all personnel is recognized as a primary concern to all participants at Oak Ridge National Laboratory (ORNL). Unsafe conditions and unsafe behavior can result in injuries and deaths as well as impact schedules, cause financial losses, and damage professional reputations. As such, it is our goal that all project participants plan, manage, and execute their respective operations with the goal of conducting their operations injury-free daily.

It is the responsibility of the Seller to adhere to the requirements of this Safety and Health Plan (SHP). Each Seller shall incorporate safety into the planning of each task, assure the safety of their personnel, provide all safety devices necessary for their employees, establish a safe and drug-free work environment, and confirm that their equipment meets the applicable safety standards. Each Seller is responsible for any actions of their personnel that may endanger or otherwise expose other participants to potential hazards on the project site.

The Integrated Safety Management System (ISMS) shall be used to achieve these goals. The ISMS is a practical approach to the prevention of accidents with an emphasis for line management responsibility for safety. A central premise is that work planning starts with a focus on the nature of the job to be performed and assessment of the hazards involved in each step. Using self-assessment and feedback from the line organizations, continuous improvement in each Seller's safety process is expected.

Project participants are required to supervise and direct activities using their best management skills and technical expertise. The Seller will be solely responsible for all work means, methods, techniques, sequences, and procedures. This includes all safety precautions and programs in connection with the work, as well as coordinating all portions of the work. Each lower-tier subcontractor is likewise required to be responsible for all safety precautions and programs in connection with the work under the Seller's contractual agreement.

All project personnel have stop work authority for any task that represents an imminent threat to safety. Only the Company can authorize a restart of the identified task.

2. INTRODUCTION

The Company has developed this SHP for implementing the principles and functions of ISMS. The Company and each Seller's line management shall share the common goal to eliminate injuries to all employees and the downtime associated with accidents. The requirements of the Occupational Safety and Health Administration (OSHA), ORNL, and this SHP establish the requirements and minimum standards that must be met or exceeded.

2.1 WORKER SAFETY AND HEALTH PROGRAM

Prior to commencement of project activities, the Seller shall:

a. Accept and agree to work to the Company's DOE-approved Worker Safety and Health Program (WSHP), or

b. Submit their DOE-approved WSHP to the Company, for review.

The Company's DOE-approved WSHP is available through the Company's Procurement – Public website.

2.2 PROJECT SAFETY AND HEALTH PLAN

Submit 5 calendar days prior to site activities:

a. For Company approval, a written SHP that complies with the requirements of this SHP, or
b. A letter stating the Seller will adopt/comply with the Company SHP.

Each Seller will budget to establish and maintain a safety and health program that meets or exceeds the requirements contained in this SHP and the applicable sections of 29 CFR 1910 and 1926.

Each Seller is solely responsible for carrying out their safety and health program. Therefore, the Company requires that each Seller designate a competent on-site employee to carry out this responsibility. Along with the Seller's line managers, this employee is directly responsible for ensuring that the Seller's program and employee actions comply with the minimum safety standards required by this SHP.

2.3 SUBCONTRACTOR HAZARD ANALYSIS

Submit for approval a written hazard analysis (HA) to the Company 5 calendar days prior to site activities. The HA shall:

a. Identify general work tasks (e.g., excavation, foundations, structural steel, roofing) anticipated during the project phases (HAs shall be task specific and not craft specific);
b. Identify any potential hazards that could reasonably be expected during these work activities;
c. List actions or precautions that will be taken to minimize the risk of such hazards that could cause an accident, injury, illness, or environmental insult;
d. Provide drawings and/or other documentation of protective measures for which applicable OSHA standards require preparation by a professional engineer or other qualified professional;
e. Identify competent persons required for workplace inspections of the project activity, where required by OSHA standards;

The supervisor shall:

f. Ensure that the HA is developed and reviewed by the employee before work begins;
g. Ensure that employees are trained in the process of developing an HA; and
h. Seek the advice of the safety officer or designee as appropriate.

2.4 SUBCONTRACTOR HEALTH AND SAFETY PROCEDURES

The Seller shall submit all safety and health procedures as required by this SHP to the Company for Company review and approval. Procedures shall be submitted 5 calendar days prior to the start of site activities that require the use of the procedure.

3. SUBCONTRACTOR RESPONSIBILITIES

3.1 EXPECTATIONS

The safety procedures established for the project are based on anticipated work activities. Future work activities may require the development of additional safety procedures or clarification of existing policies and procedures.

It is the responsibility of each employee to work in a safe manner. However, it is ultimately the responsibility of the Seller's line management to see that all safety and health rules and practices are followed.

Safety is never to be sacrificed for production. The safety goal for all projects is to eliminate actions that cause accidents or illnesses.

Each Seller has the explicit responsibility to perform work in accordance with this SHP. Seller line managers are accountable for fulfilling the responsibilities listed in this section, in addition to compliance with their own company requirements, and for attending meetings to discuss or resolve safety issues.

During all execution of field construction activities, the Seller shall designate a person to be responsible for enforcement of safety rules and regulations associated with the ongoing work. This designated individual shall have enough knowledge and understanding of the work, the Seller's means and methods, and any applicable regulatory requirements to ensure that the work can be prosecuted safely and compliantly. This person shall also have:

a. Minimum 30-hour OSHA Construction Safety Course.
b. Experience and the authority to stop work if the safety and health of a worker or the environment are in danger.
c. Enough time and resources to execute the designated safety and health responsibilities as a priority of work. The designated individual may have concurrent additional job-site duties only to the extent that those additional duties do not interfere with the ability to perform S&H responsibilities. S&H shall be the priority, and any other duties shall be immediately suspended if they interfere.
d. The Seller shall have access to a safety professional that by degree, certification, and/or experience can provide guidance and assistance to the designee in matters of industrial hygiene, industrial safety, or other S&H-related topics.

The Company reserves the option to require a full-time safety representative if the complexity of the scope changes or the Seller does not adequately focus on S&H during the execution of the project.

3.2 FIELD MANAGER OR SUPERVISORS

Each Seller field manager and supervisor has the responsibility for overall training, control, and conduct of personnel on their crew. As first-line supervisors, their role in the safety and health program is crucial because they set standards by which their employees work.

Field supervisor responsibilities include, but are not limited to:

1. Conducting task-specific safety training,
2. Conducting daily safety inspections,
3. Conducting safety sampling,
4. Conducting toolbox safety meetings,
5. Apprising the Company of any safety-related problems that have or may develop,
6. Conducting investigations of all accidents and incidents and submitting reports to the Company, and
7. Compiling OSHA statistical information and reporting this information to the Company.

3.3 DEFINITIONS

Dedicated Safety Representative: A full-time dedicated safety representative is an individual (1) scheduled to be on-site during work hours and (2) assigned to exclusively carry out safety-related duties. Specifically, the dedicated safety representative shall not have other responsibilities that may take his or her attention from the expected safety duties. The individual is required to have 2 years or more of safety experience and have completed the OSHA 30-hour Construction Safety and Health course.

Safety Designee: A safety designee is an individual who, in addition to other project-related duties, is responsible for performing safety-related duties. As a minimum, this individual is required to have completed the OSHA 30-hour course.

3.4 ON-SITE SAFETY REPRESENTATIVE OR DESIGNEE

Specific responsibilities of the designated safety representative and the safety designee include, but are not limited to, the following:

3.4.1 Employee Safety Orientation and Training

- Conduct orientation sessions for employees new to the project site, prior to their beginning work;
- Participate in weekly toolbox safety meetings and assist field supervisors, as requested, with meetings;
- Instruct supervisors on safety rules and regulations;
- Instruct employees in the proper use and care of personal protective equipment;
- Instruct employees concerning special procedures (e.g., lockout, excavation, confined space entry, etc.) as required by OSHA and this SHP; and
- Conduct or arrange for appropriate training.

Seller shall confirm that training for their employees and their lower-tier subcontractor employees is adequate for the tasks being performed.

3.4.2 Recordkeeping

- Complete OSHA, state, federal, Company, and project-specific reports;
- Complete accident investigation reports;

- Complete inspection reports; and
- Maintain training documentation.

3.4.3 Safety Standards, Rules, and Regulations

- Accept authority to stop work;
- Accept authority to take immediate corrective action;
- Implement, maintain, and update, as required, conditions and project-site-specific safety policies and procedures;
- Interpret and implement site-specific safety policies and procedures; and
- Demonstrate, by example, proper safety behavior.

3.5 EMERGENCY SERVICES AND EQUIPMENT

If a serious or life-threatening injury occurs, ORNL will provide emergency ambulance and firefighting services. Seller employees must use a facility phone to dial 911 or pull a fire alarm box to notify ORNL for emergency response. **If using a privately-owned cell phone, Seller must call the Laboratory Shift Superintendent (LSS) at (865) 574-6606.**

In the event of a less-serious injury, Seller employees will be sent to physicians/medical treatment facilities identified by the Seller. In addition to the injury recordkeeping required by OSHA, Seller shall inform the Company of any injury requiring first-aid and of all more serious occupational injuries and illnesses within one hour of the classification of the injury.

3.6 ORIENTATION

The Seller shall ensure that their employees are briefed on what they can expect and what is expected of them during execution of this project.

Newly employed, promoted, and/or transferred personnel shall be fully instructed in the safety practices required by their assignments. All employees must receive orientation prior to starting work. Visitors must also receive orientation prior to leaving the office areas or be escorted while on-site. The initial indoctrination is to be performed by the Seller's safety designee or dedicated safety representative.

In addition to the Seller's safety and health policies, the orientation must include:

- Employee safety requirements and policies specific to the project;
- Site-specific safety and health requirements;
- Permitting procedures (if applicable), including work permits, hot work permits, etc.;
- Hazard communication on a multi-employer work site;
- Emergency and medical procedures; and
- Other topics as circumstances require.

All employees will complete an Orientation Acknowledgement form at the end of the orientation.

3.7 EQUIPMENT AND MACHINERY

Seller personnel shall be trained in the operation, inspection, and maintenance of the equipment, safety features, and procedures to be utilized during operation, inspection, and maintenance of the equipment. This training shall be based on the equipment operating manual and the hazard analysis for the activity.

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested by a competent person and certified to be in safe operating condition. Inspections and tests shall be in accordance with manufacturer's recommendations and shall be documented. Records of tests and inspections shall be maintained at the site by the Seller, shall be made available upon request, and shall become part of the official project file.

All machinery and equipment shall be inspected daily (when in use) to ensure safe operating conditions. The Seller shall designate competent persons to conduct the daily inspections and tests. Tests shall be performed at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional.

Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency that affects the safe operation of equipment is observed, the equipment shall be immediately taken out of service and its use prohibited until unsafe conditions have been corrected. A tag indicating that the equipment shall not be operated, and that the tag shall not be removed, shall be placed in a conspicuous location on the equipment.

Machinery and mechanized equipment shall be operated only by designated qualified personnel. Machinery and equipment shall neither be operated in a manner that will endanger persons or property nor shall the safe operating speeds or loads be exceeded. Equipment will be utilized only for its designed purpose and in accordance with the manufacturer's instructions and recommendations.

Modifications, extensions, replacement parts, or repairs of equipment shall maintain at least the same factor of safety as the original equipment. Modifications shall be authorized in writing by the manufacturer.

3.8 EVACUATION OF THE WORK AREA

Seller shall observe and participate in notices to evacuate the work area except for company planned drills. All workers will evacuate to the assembly point identified in the orientation/hazard analysis. Before evacuating the work area, equipment or processes that could become a safety or fire hazard if left unattended should be shut down or made safe.

3.9 ACCIDENT/INCIDENT INVESTIGATIONS AND REPORTING

All incidents involving illness/injury, property damage, or near-miss must be immediately reported to the Company. This is to include repairable damage to equipment or materials and first-aid cases. Such incidents must be investigated by the Seller safety representative or designee and documented on an Appendix B, "Incident Investigation Report" (or equivalent). The report must be completed and submitted to the Company within 24 hours of the incident. The Company reserves the right to conduct an independent investigation of any incident.

An incident investigation committee will investigate all major incidents. This includes, but is not limited to, any incident resulting in a medical case, lost-time injury, fatality, damage to property or equipment, or a near-miss that could have resulted in such an incident. The committee will review the incident scene, interview all involved or witnessing parties, review all facts pertaining to the accident, and file a report to the Company of the findings and conclusions as well as recommended measures to prevent reoccurrence. The committee will be comprised of, but not limited to:

- Person(s) involved in the incident,
- First-line supervisor of the person(s) involved in the incident,
- Superintendent of the employing Seller,
- Safety representative or designee of the employing Seller,
- Safety representative or designee of the Seller, and
- Project Safety Coordinator or designee.

A DOE F 5484.3 "Individual Accident/Incident Report" must be submitted within two working days of a recordable or lost-time injury or illness (OSHA definition). The Company will provide the report form upon request.

3.10 PERSONAL PROTECTIVE EQUIPMENT

The Seller is responsible for providing the appropriate personal protective equipment (PPE) in all operations/tasks where there is an exposure to hazardous conditions or where the use of such equipment will reduce the hazards to the employees. A comprehensive hazard assessment shall be conducted to determine proper types of PPE required for the worksite.

PPE and safety equipment shall be tested, inspected, and maintained in serviceable and sanitary condition as recommended by the manufacturer. Users of PPE and safety equipment shall be trained in the use, limitations, inspection, testing, and maintenance of the equipment.

Basic Eye Protection—Employees must wear ANSI Z87-approved safety glasses with side shields 100% of the time when potentially exposed to hazards from flying particles, molten metal, liquid chemicals, acids, or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Clothing—Employees are to report to work properly attired for the work. Additional body protection will depend on identification of specific hazards.

Contact Lenses—Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments might represent an additional hazard to contact lens wearers. Hazardous environments include, but are not limited to, those in which a respirator may be required or where welding is being performed.

Face Shield and Goggles—When Seller employees are exposed to splashes, mists, etc., either goggles or a face shield must be worn, depending on the situation. With a face shield, basic eye protection must also be worn.

Foot Protection—Seller personnel who face possible foot injuries from falling or rolling objects or from crushing or penetrating materials must wear ANSI Z41-approved protective work shoes or boots.

Head Protection—All persons must wear head protection if objects might fall from above and strike them on the head, if they might bump their heads against fixed objects, or there is a possibility of accidental head contact with electrical hazards. All construction-designated areas are considered hard hat areas.

Hearing Protection—The safety representative or designee will monitor work areas to identify and post high noise areas and provide appropriate hearing protection.

High Visibility Vests—All persons exposed to the risk of being struck by motor vehicles and heavy equipment must wear high-visibility apparel in accordance with ANSI/ISEA.

Welding Shield—Shields shall be of proper material and shade for work being performed. If welding goggles are worn, basic eye protection is not required while welding.

3.11 ON-SITE SAFETY INSPECTIONS

Seller supervisors are to conduct and document frequent and regular inspections of the worksite to identify any instances of noncompliance with project S&H requirements.

3.12 WEEKLY TOOLBOX MEETINGS

Seller supervisors are to conduct weekly toolbox safety meetings. Records of the meetings are retained on-site by the Seller.

3.13 PROTECTION OF WORK AREAS

Seller must ensure that the work areas and storage areas are conspicuously flagged and barricaded, as needed, prior to initiation of work.

Seller must furnish, post, erect, and install safety devices, equipment, signs, barricades, flagging, and any other item necessary to give adequate warning and caution of hazards, and to provide instructions and directions to workers and the public.

- Caution signs with caution tape or other physical barricade shall be used to warn against potential hazards or to caution against unsafe practices.
- Caution signs and tape shall be yellow with black lettering.
- Danger signs shall be used where an immediate hazard exists.
- Danger signs and tape shall have black lettering.
- A contact name and telephone shall be posted for each barricaded area.

Traffic control signage, locations, and flagman shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD).

3.14 WORKING AND STORAGE AREAS

Housekeeping is a general indicator of Seller on-site performance, including safety performance. Each Seller has the responsibility to maintain its area of operations, and those of their lower-tier subcontractors, in an orderly condition free of materials that could create slip/trip or fire hazards. In addition, Seller

supervisors shall ensure that a daily walk-down of their work area is conducted, that any deficiencies are immediately corrected, and that the condition of the site is reported to the Seller supervisor.

All materials and equipment in storage, laydown, staging, or work areas must be properly secured so that they are stable and secure against sliding or collapse. All materials storage and loading/unloading areas must be established a safe distance from walkways, aisles, and traffic areas to avoid personnel injury should materials slide or collapse.

4. INDUSTRIAL HYGIENE/EXPOSURE MONITORING

Industrial hygiene is the science of anticipating, recognizing, evaluating, and controlling workplace conditions that may cause worker injury or illness. Seller shall be responsible for all monitoring to ensure compliance with the exposure criteria. Approved and calibrated testing devices shall be provided for the measurement of hazardous substances, agents, or environments. Individuals performing testing and monitoring shall be trained in testing and monitoring procedures and hazards. Testing devices shall be used, inspected, and maintained in accordance with the manufacturer's instructions.

Determination of the concentrations of, and hazards from, hazardous substances, agents, and environments shall be made by a qualified industrial hygienist or other competent person as frequently as necessary to ensure the safety and health of the work environment.

Evaluation criteria are used as guidelines to assess the potential health effects of occupational exposures to substances and conditions found in the work environment. These criteria are generally established at levels that can be tolerated by most healthy workers occupationally exposed day after day for a working lifetime without adverse effects. Because of variation in individual susceptibility, a small percentage of workers may experience health problems or discomfort at exposure levels below these existing criteria. Consequently, it is important to understand that these evaluation criteria are guidelines, not absolute limits between safe and dangerous levels of exposure.

Exposure to any chemical or physical agent via inhalation, ingestion, skin absorption, or physical contact in excess of the acceptable limits specified in 29 CFR 1926, Subpart Z and/or the American Conference of Government Industrial Hygienists (ACGIH) "Threshold Limit Values and Biological Exposure Indices" shall be prohibited. In the event of conflicts between ACGIH and OSHA criteria, the more stringent shall prevail.

5. HAZARDOUS WORK REQUIREMENTS

5.1 CRYSTALLINE SILICA

If work involves the release of crystalline silica dust, the Seller shall take proper precautions to protect employees and staff from exposure. The disturbance of silica-containing products shall be identified prior to starting work. This could include concrete, masonry, drywall, stone, ceramics, and other silica-containing products. The Seller shall determine the proper method of control for the work to prevent release of silica-containing dust. Exposure monitoring may be required.

5.2 COMPRESSED GAS CYLINDERS

Seller must ensure that these containers are not defective or leaking any product.

Containers not bearing legibly written, stamped, or stenciled identification of the contents shall not be used.

Compressed gas cylinders shall not be used as rollers, supports, or for any purpose other than to contain and use the contents as received.

The container valve shall always be kept closed (charged or empty), except when the container is in use.

Compressed gas containers shall not be rolled in the horizontal position or dragged. A suitable hand truck, forklift, or similar material handling device should be used with the container properly secured to the device.

Containers are not to be stored near readily ignitable substances, such as gasoline, oil, or scrap material.

All compressed gas cylinders shall be stored and used valve end up. The cylinders shall be secured to prevent instability.

Valve protection caps should always be in place and hand tight, except when cylinders are in use or connected for use.

5.3 CONFINED SPACE

Seller shall submit the Seller's Confined Space Procedure for Company approval or shall follow the Company's Confined Space Program and training requirements.

A confined space is defined as a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work;
- Has limited or restricted means for entry or exit—for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry; and
- Is not designed for continuous employee occupancy.

A permit-required confined space has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere,
- Contains a material that has the potential of engulfing an entrant,
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section, and
- Contains any other recognized serious acute safety or health hazard.

Operations involving a confined space entry require an evaluation of work by the Seller and the Company's S&H Representative to classify the space as permit-required or non-permit-required.

Permit-required confined spaces require a confined space permit that addresses all elements of 29 CFR 1910.146.

Retrieval equipment shall be provided to facilitate non-entry rescue for all permit-required spaces unless evaluation of the permit-required confined space determines that the use of retrieval equipment creates greater health and safety hazards. In this case, rescue services shall be notified that entry into the confined space will be necessary to perform rescue operations.

5.4 DEMOLITION

The Seller shall perform an engineering survey of the structure to determine the condition of the framing, floors, and walls, and the possibility of unplanned collapse of any portion of the structure. The Seller shall provide written evidence that such a survey has been performed.

The Company will ensure that electric, gas, water, steam, and other service lines are shut off, capped, or otherwise controlled by locks before demolition work is started.

For demolition projects, the Company will perform building deactivation, termination, and/or relocation of utilities (if required). Visible air-gapping for utility deactivation and termination will be performed where possible. The Seller shall verify that appropriate lockouts, or air gaps are in place, and verify or witness the Company's verification absence of hazardous energy for systems that have been de-energized prior to commencing work on those systems.

The Company will determine if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed, and the hazard eliminated before demolition is started.

The Seller shall perform demolition in accordance to 29 CFR 1926.850 through 1926.860.

5.5 ELECTRICAL SAFETY

Electrical installation and maintenance operations shall be conducted in accordance with applicable requirements in 29 CFR 1926 Subpart K, 29 CFR 1910 Subpart S, NFPA 70, "National Electrical Code", and current revision of NFPA 70E, "Standard for Electrical Safety in the Workplace."

Seller must ensure that electrical work is performed by qualified persons.

Seller must provide a ground fault circuit interrupter for cord sets, receptacles, and electrical tools, including plug and cord connections to generators and equipment for employee use.

All unfinished circuits are to be tested for energy, capped with wire nuts, and pushed into the box by an electrician. All employees are to be instructed that any wires not capped are assumed to be live and are to be reported to a company representative.

Seller must provide three-wire extension cords of continuous length without splices and designed for hard or extra-hard use.

Seller must protect electrical extension cords from pinch points, sharp edges, pedestrian or vehicle traffic, or other potentially damaging configurations. Extension cords must not be fastened with staples, hung with nails, or suspended on wires.

Extension cords must be arranged in a manner that avoids creating tripping hazards.

Seller shall notify the Company prior to any work being done near overhead lines. Overhead lines shall be de-energized and grounded, or other protective measures (guarding, isolating, insulating, etc.) shall be provided, before work is performed in the vicinity of overhead lines. This will be accomplished by the ORNL Electrical Power Operations Group.

Any vehicle operated in proximity to overhead lines shall maintain the following minimum distance:

- Ten feet (305 cm) for voltage of 50 kV or below;
- Ten feet (305 cm) plus 4 inches (10 cm) per 10 kV for voltage greater than 50 kV; or
- Four feet (122 cm) for vehicles in transit, with its structure lowered for voltages 50 kV or below, with clearance increased 4 inches (10 cm) for every 10 kV over that voltage.

Live parts to which employees might be exposed shall be put into an electrically safe work condition. Energized parts that operate at less than 50 volts to ground and containing less than 5 joules of stored electrical energy are not required to be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Shared neutrals are not permitted for new construction unless otherwise approved by the Company.

“Working on or near” or “working hot” requires approval by the Company utilizing an “Energized Electrical Work Permit.” The Company will responsible for performing Lockout/Tagout for active Company-owned utilities within the Seller’s work scope. Seller shall follow the guidelines in NFPA 70E, “Standard for Electrical Safety in the Workplace,” for applicable approach boundaries and PPE. A task-specific hazard analysis shall be utilized to ensure that workers understand their role in the work to be performed, as well as what others involved in that project or task will be doing.

All electrical equipment utilized by the Seller shall be certified by a Nationally Recognized Testing Laboratory or shall be inspected by an SNS Electrical Inspector.

All projects that involve demolition, modification, or installation of electrical equipment or systems shall be inspected by a Certified Electrical Inspector (CEI). Electrical inspections shall include as a minimum, service equipment, rough-in, and finish as applicable. Electrical inspection reports shall be generated and included with other project records.

5.6 ELEVATED WORK/FALL PROTECTION

Seller must provide appropriate fall protection for its employees working 6 feet or more above the work surface. This includes steel erection. The Seller competent fall protection person must fully evaluate the work conditions and environmental factors (including seasonal weather changes) before selecting the appropriate fall protection system (active, passive, or a combination of measures, as appropriate). Such evaluation is to be included in the hazard analysis for the task.

Employees shall be trained in the selection and safe use of fall protection systems before the equipment is used. This can be accomplished in a safety meeting or pre-job briefing.

5.7 EXCAVATION/PENETRATION

The excavation/penetration permit process is utilized to provide for the safety of personnel and protection of existing utilities and facilities during work activities requiring excavations and/or penetrations into structures. Seller is responsible for following the Company's excavation/penetration permit procedure/process.

Prior to excavation/penetration, the estimated location of utility installations (e.g., sewer, telephone, water, fuel, electric lines) underground and in walls, floors, etc. shall be determined by the Company and protected from damage or displacement. Before excavation/penetration, the Seller shall work with the Company's representative to designate the area of excavation with white paint, white stakes, or white flags. The Company will provide the utility locates and the Seller with an excavation/penetration permit. The permit shall be posted at the work site.

For penetrating activities (including installation of fasteners less than two inches) where the subsurface elements are unknown, one of the following requirements must be performed:

- work associated with the installation of fasteners to newly constructed floors, walls, and ceilings. "New" construction work is an integrated activity of an overall sub-project being managed under a single responsible and knowledgeable construction contractor, or
- work associated installation of fasteners 2 inches or less in embedded depth to floors, walls, and ceilings where the sub-surface elements are unknown require double insulated electrically operated equipment/tools or non-powered tools during installation.

Additional exemptions for penetration activities:

- work associated with the installation of dry wall anchors 1-1/4 inches or less in embedded depth to wall (unless they are being placed in a fire/smoke barrier). These dry wall anchors shall be installed only with non-powered tools, or
- work associated with installation of fasteners into shield blocks, floors, ceilings, and walls for anchoring purposes, requiring drilled holes less than or equal to ½ inch diameter to maximum 2 inches, will not require a permit when drill is equipped with an "electronic drill stop" that will stop the drill immediately when embedded grounded material such as rebar or grounding cable is contacted. When embedded materials are encountered, drilling shall be stopped, and a new location selected. The abandoned holes shall be patched and painted for
    - penetration of hollow-core walls and ceilings (unless they are a fire/smoke barrier),
    - penetration of masonry walls (unless they are a fire/smoke barrier), and
    - penetration of pavements and sidewalks not in excess of their thickness.
- Earth/rock excavations 12 inches or less in depth with surface area not in excess of 100 square feet, using hand-held tools excluding jackhammers, after utility locates indicate that the area does not contain any utilities in the 12-inch depth.

5.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS

Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less (this does not apply to those liquids that are extremely hard to pour, which may be handled in original containers). For quantities of 1 gallon or less, the original container may be used for storage, use, and handling of flammable liquids.

Containers of flammable and combustible liquids shall be tightly capped when not in actual use.

Flammable liquids may be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

All sources of ignition shall be prohibited in areas where flammable and combustible liquids are stored, handled, and processed. Suitable "No Smoking" or "Open Flame" signs shall be posted in all such areas.

Areas where flammable or combustible liquids are transferred at one time, in quantities greater than 5 gallons from one tank or container, shall be separated from other operations by 25 feet distance or by construction having a fire rating of at least 1 hour.

A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids are being used on the job site. This does not apply to the integral fuel tanks of motor vehicles.

ORNL will provide firefighting services. Seller employees must use a facility phone to dial 911or pull a fire alarm box to notify ORNL for emergency response. If using a privately-owned cell phone, Seller must call the Laboratory Shift Superintendent (LSS) at (865) 574-6606.

5.9 HAND AND POWER TOOLS

Hand and power tools shall be used, inspected, and maintained in accordance with the manufacturer's instructions and shall be used only for the purpose for which designed.

Power tools designed to accommodate guards shall be equipped with such guards when in use. Reciprocating, rotating, and moving parts of equipment shall be guarded if exposed to contact by employees or otherwise create a hazard.

Tools and equipment showing evidence of safety hazards shall not be brought on site. Should hazards become evident after work is initiated, remove the tool from use, clearly indicate the tool is not to be used, and take the tool from the site at the end of the work shift.

5.10 HAZARD COMMUNICATION

Seller must demonstrate compliance with a hazard communication program including employee information and training, provisions for labeling, and availability of safety data sheets (SDSs).

Seller shall maintain SDSs for hazardous chemicals brought on-site and shall supply information regarding hazardous chemicals to the project representative prior to initiation of activities that may potentially expose project personnel to a hazard at the job location. Upon request, Seller shall provide the Company any applicable SDS as required by OSHA.

Seller shall remove all unused chemicals or materials brought to the site at the completion of the job.

5.11 HEAT AND COLD STRESS

Personnel exposed to temperature extremes shall be protected in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) guidelines by implementing appropriate engineering controls, work-rest regimens, and/or personal protective equipment.

5.12 HOISTING AND RIGGING

Hoisting and rigging activities shall be performed in accordance with 29 CFR 1910 Subpart N, 29 CFR 1926 Subparts H and N, DOE Standard 1090, and ANSI B30 and B56 Series.

All operations that require hoisting and rigging shall have a hazard assessment and appropriate lift plan prior to beginning work to ensure safety and compliance.

Certification documents showing that Seller hoisting and rigging equipment meets the requirements will be provided to the Company for review. If an inspection certificate expires while the equipment is on site, the equipment will be re-inspected, and the inspection certificate updated before continuing work activities.

Equipment operators/riggers, including alternates, shall be qualified to perform their assigned functions. Qualifications shall include physical, knowledge, and skills proficiency based on job function.

The four-leg slings shall be rated as two-leg slings, since it cannot always be determined that all legs will be loaded equally. Other multiple-leg slings should be given due consideration for possible uneven loading.

Each lift shall be classified as ordinary or critical. Lift plan forms are available from the Company construction field representative (CFR).

5.12.1 Critical Lift

A lift will be considered critical when any one of the following conditions exists:

- The load item, if damaged or upset, would result in a release into the environment exceeding established permissible environment limits of radioactivity or other hazardous material or other undesirable conditions.
- The load item is unique and, if damaged, would be (1) irreplaceable or (2) not repairable and is vital to a system, facility, or project operation.
- The cost to replace or repair the load item or the delay in operations of having the load item damage would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
- A lift not meeting the above criteria shall also be designed critical if mishandling or dropping of the load would cause (1) any of the above-noted consequence to nearby installation or facilities or (2) if there was undetectable damage it would jeopardize future operations or the safety of a facility.

- It is necessary to use two or more cranes or forklifts or special hoisting/rigging equipment.
- The lift exceeds 75% capacity of crane (steel erection only).
- The lift exceeds 90% capacity of a mobile crane (non-steel erection items).
- The load requires exceptional care in handling because of size, weight, close-tolerance installation, high susceptibility to damage, or other unusual factors.

The critical lift plan must be developed by the Seller in conjunction with the SHP and HA. The critical lift plan must be approved by:

- Subcontractor Lift Supervisor,
- Subcontractor Safety and Health Representative/Designee,
- Operators performing the lift,
- Project Engineer,
- Construction Field Representative
- Project Safety and Health, and
- Company Level II Manager.

Required attachments to the critical lift plan include:

- Crane operator certification must be issued through a certified competent and must be up-to-date, and all operator certifications must be attached to the plan or be on file;
- Type, size, capacity, engineered designs, and manufacturer of shackles, hooks, jacks, rollers, come-a-longs, spreader bars, and slings;
- Type, size, capacity rating, manufacturer, capacity certificates, and inspection reports for all cranes and other lifting equipment; and
- Lift geometry and free body diagrams to illustrate the individual tensions of each sling involved in the lift, and any shift of weight when the load is lifted.

A complete rigging diagram must be attached to the critical lift plan. The rigging diagram must include the entire rigging process and the following minimum information:

- Type and capacity of lifting equipment;
- Crane boom length, radius, and location of outriggers;
- A plot of the path of travel including all vertical and horizontal clearances form such items as adjacent equipment, power lines, and other encumbrances or hazards;
- Location, size and capabilities of lifting lugs, slings, and other rigging accessories as well as the method of attachment;
- Position of load in relation to the boom to show hook clearance and distance between the boom and the load;
- Description, size, capacity, and location of miscellaneous equipment such as dollies, jacks, hand wrenches, rollers, etc.;
- Location of mats and cribbing used before, during, and after the lift;
- Location and orientation of equipment; and

- Location of underground lines (utility lines, electrical duct banks, cables, etc.), abandoned vessels and tanks, and foundations.

Critical lift plans must be submitted to the Company nominally 5 working days prior to making the lift.

Hoisting and rigging equipment (e.g., slings, shackles, etc.) used for critical-lift service shall have an initial proof load test of 200 percent of the rated capacity.

5.12.2 Ordinary Lift

Any lift that does not meet the definition of a critical lift is considered an ordinary lift. The ordinary production lift plan form can be used, or the information can be included in the HA. The ordinary lift plan/lift ticket must include type, size, and capacity of hoisting and rigging equipment, lift geometry and free body diagram to illustrate the individual tensions on each piece of equipment.

Ordinary production lift plans must be submitted to the Company nominally 5 working days prior to making the lift.

Ordinary production lift plans must be approved by the Seller's supervisor and safety and health representative, and the CFR.

5.13 LEAD

Work involving lead shall be performed according to 29 CFR 1926.62, Lead.

The HA shall contain a description of each operation/task in which lead may be emitted and a description of the specific means that will be employed to achieve compliance.

Every task associated with handling/disturbing lead and lead-containing paints shall be evaluated to determine if the employees may be exposed to lead at or above the action level (30 micrograms per cubic meter of air calculated as an 8-hour time-weighted average). Where a determination is made that an employee may possibly be exposed at or above the action level, Seller shall conduct an exposure assessment to include personal air monitoring, if feasible, to determine employee exposure.

Seller shall, if possible, remove lead containing paint from affected work surfaces before initiating work (grinding, torch cutting and burning, demolition by hammer or similar tool, manual scraping, manual sanding), which could generate an aerosol. Chemical stripping is the preferred method of paint removal.

The Company may elect to remove all lead paint from affected work surfaces before Seller initiates work. Provide at least 14 days advance notice to the Company for the area(s) requiring lead removal.

5.14 LOCK, TAG, VERIFY

Lock, Tag, Verify (LTV) procedures must be strictly followed when it is necessary to work on any equipment that may release hazardous energy while the equipment is shut down. Energy means mechanical motion, potential energy due to pressure, gravity, or springs, electrical energy, or thermal energy.

LTV is required whenever servicing, maintenance, or modification is being performed on equipment in which the unexpected energization or startup of the equipment, or the release of stored energy, could cause injury to people. All sources of hazardous energy must be shut off and secured. LTV must be performed by each person who works on the equipment.

The Company will perform LTV of applicable Company controlled systems and equipment. Seller must provide at least 5 working days advance notice to the Company of systems requiring LTV.

Company LTV: During the initial isolation and LTV by the Company, the seller shall witness verification. Seller employees shall verify isolation and overlock isolation points (or a lockbox) with their personal locks. These locks shall be identified with the Seller employee's name and a unique employee identification number (a tag can be used to provide identifying information). A detailed tag must be used in conjunction with the lock if the lockout period extends beyond the work shift. Necessary information will include who locked and tagged out the energy source, brief description of task, and the date tag was applied.

Upon completion of work, Seller employees shall remove all personal locks and notify the Company. The removal of the project lock(s) shall not precede the removal of the Seller lock(s).

Seller LTV: Hazardous energy sources introduced by the Seller must be controlled by Seller's hazardous energy control procedure. The Seller shall submit the Seller's hazardous energy control program/procedure for Company's review and approval. The procedure/HA must include/address the following:

- The authorized employee must assess the type, magnitude, and hazards of the energy to be controlled.
- The authorized employee must determine the appropriate methods of controlling the hazardous energy (e.g., disconnect switch or valve). Note: push buttons, selector switches, interlock circuits, and other control type devices are not energy-isolating devices.
- The authorized employee must notify all affected employees of the impending shutdown, the reasons for it, and anticipated duration of shutdown.
- The authorized employee must verify that it is safe to shut down the equipment.
- The authorized employee must turn off or shut down the equipment using established methods for that equipment.
- The authorized employee must operate the energy-isolating device and affix his/her LTV lock to this device. The lock must be affixed to hold the energy-isolating device in an off or safe position that physically prohibits normal operation of the energy-isolating device. Where more than one authorized employee is involved in the job and a Group LTV procedure is not used, each authorized employee must affix his/her personal lock using a multiple lock hasp.
- The tag is used to provide identifying information. The authorized employee must complete all appropriate information on the tag. If the placement of the tag would compromise safety by obscuring indicator lights or controls, the tag may be located as close as is safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device. Where more than one authorized employee is involved in the job, and a Group LTV procedure is not used each authorized employee must affix his/her own personal tag on a multiple lock hasp. The use of a tag only system is only permitted when the equipment being isolated is not capable of being locked out.

- The authorized employee must completely release or otherwise control any stored energy. In the case of stored mechanical energy, vent valves, spring releases, blocking devices, or equipment repositioning (as appropriate) must be utilized. In the case of stored electrical energy, approved grounding wands or discharge devices must be used.
- If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing, maintenance, or modification is completed or until the possibility of such accumulations no longer exists. The equipment must be in a zero-energy state.
- For verification, the authorized employee must physically attempt to operate the energy-isolating device and attempt to restart the equipment using the normal equipment controls (e.g., push buttons, selector switches, and electrical interlocks or otherwise verify that the equipment cannot be restarted).
- If the equipment is electrical, the authorized employee must additionally test potential electrical energy sources using appropriate instruments or testers. The authorized employee shall use test equipment to verify that the circuit elements and equipment parts are de-energized, and shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the authorized employee is not qualified to test the energy being isolated, he/she must ensure that a qualified person tests the energy. If the circuit to be tested is over 600 volts, nominal, the test equipment must be checked for proper operation before and immediately after this test. Note: All test equipment must be checked for proper operation regardless of the voltage. Circuits over 600 volts may require special test equipment.

ALL LTV: Although electrical LTV verification/testing is only properly performed on de-energized equipment, there can be occasional surprises (e.g., multiple feeds or sources, or stored electrical energy) and such verification may indeed be on or near unexpectedly energized (live) electrical parts. As such, electrical LTV verification shall be treated as "working on or near." The qualified worker must approach the hazard with the assumption that the system is energized until it is verified to be de-energized, and as such must follow the guidelines presented in NFPA 70E for determining approach boundaries and PPE. The "working on or near" or "working hot" permit is not required for LTV verification/testing.

Before LTV devices are removed and energy is restored to the equipment, the authorized employee must:

- Notify Company (for Company systems) that work is complete and an "Inspection Approval" is requested.
- Notify Company (for Company systems) that the pending "Inspection Approval" activity is complete, and the system is ready for energization.
- Verify that it is safe to remove and/or reenergize. The authorized employee must verify that the work for which the LTV was applied has been completed and that it is safe to reenergize equipment. The authorized employee must check the work area to ensure that all tools and personnel are at a safe distance from the equipment;
- Remove all isolating and grounding devices. The authorized employee must check the equipment to ensure that any removed guards are reinstalled; and
- Remove lock and tag, reset the energy-isolating device, and return the machinery to service. The authorized employee must notify all affected employees that the equipment is back in service.

5.14 LOGGING/TREE REMOVAL

Operations including, but not limited to, felling trees (cutting, as opposed to bulldozing trees), cutting branches off trees and logs, cutting felled trees into logs, chipping branches, and loading and unloading logs in the preparation for construction activities are considered to be a logging operation and shall be accomplished in accordance with the requirements of 29 CFR 1910.266, Logging Operations.

Prior to felling operations, a survey shall be conducted to identify overhead electrical hazards. The findings of this survey and the controls for all potential hazards shall become a part of the hazard analysis.

Prior to felling operations, the work area shall be cleared to permit safe working conditions and an escape route shall be kept clear of the work area. The distance between adjacent occupied work areas shall be at least two tree lengths of the trees being felled.

The ORNL Electrical Power Operations Group shall be notified prior to any work being done near overhead lines.

The Seller shall provide, at no cost to the employee, and assure that each employee who operates a chain saw wears eye, ear, hand, and foot and leg protection constructed with cut-resistant material. The leg protection shall cover the full length of the thigh to the top of the boot on each leg to protect against contact with a moving chain saw.

Each employee performing a logging operation shall work in a position or location that is within visual or audible contact with another employee.

5.15 POWER TRANSMISSION AND DISTRIBUTION

Seller shall perform work in compliance with Subpart V, “Power Transmission and Distribution” (Sections1926.950–960).

As used in Subpart V, the term “construction” includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing electric transmission and distribution lines and equipment.

Existing conditions shall be determined before starting work, by an inspection or a test. Such conditions shall include, but not be limited to, energized lines and equipment, conditions of poles, and the location of circuits and equipment, including power and communication lines, CATV, and fire alarm circuits.

Electric equipment and lines shall be considered energized until determined to be de-energized by the Company.

No employee shall be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table 1, unless:

- The employee is insulated or guarded from the energized part (gloves or gloves with sleeves rated for the voltage involved shall be considered insulation of the employee from the energized part); or
- The energized part is insulated or guarded from him and any other conductive object at a different potential; or

- The employee is isolated, insulated, or guarded from any other conductive object(s), as during live-line bare-hand work.

The minimum working distance and minimum clear hot stick distances stated in Table 1 shall not be violated. The minimum clear hot stick distance is that for the use of live-line tools held by linemen when performing live-line work.

Conductor support tools, such as link sticks, strain carriers, and insulator cradles, may be used, provided, that the clear insulation is of the insulator string or the minimum distance specified in Table 1 for the operating voltage.

Table 1. Alternating Current – Minimum Distances

Voltage Range (Phase to Phase) (kilovolt)	Minimum Working and Clear Hot Stick Distance
2.1 to 15	2 ft. 0 in.
15.1 to 35	2 ft. 4 in.
35.1 to 46	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121	3 ft. 4 in.
138 to 145	3 ft. 6 in.
161 to 169	3 ft. 8 in.
230 to 242	5 ft. 0 in.
345 to 362	7 ft. 0 in.[a]
500 to 552	11 ft. 0 in.[a]
700 to 765	15 ft. 0 in. [a]

[a] For 345–362 kV, 500–552 kV, and 700–765 kV, the minimum clear hot stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and the grounded surface.

The employer shall provide training or require that his employees are knowledgeable and proficient in procedures involving emergency situations, and first-aid fundamentals, including resuscitation.

When construction work is performed in an energized substation, authorization shall be obtained from the designated, authorized person before work is started.

When work is to be done in an energized substation, the following shall be determined:

- The facilities to be energized, and
- The protective equipment and precautions necessary for personnel safety.

5.16 RESPIRATORY PROTECTION

If respiratory protection is required, the Seller shall determine which respirator type or class will offer adequate protection

The Seller shall provide respirators in accordance with the following:

- If Seller employees are required to wear negative or positive pressure, tight-fitting respirators, they shall have been medically evaluated;
- Ensure respirator wearers have completed the respirator quantitative fit testing and respirator training;
- Provide respirators and cartridge type specified to protect worker from exposure to identified or suspected hazards as specified in the hazard analysis;
- Provide breathing air, if required. Submit data to Company demonstrating the compressed breathing air quality supplied to the air respiratory protections systems meet the ANSI/CGA G7.1, Commodity Specification for Air, requirements;
- Provide optical corrections for appropriate respirators;
- Ensure that all respirators are NIOSH certified; and
- Seller shall submit its Respiratory Protection Program for the Company's review and approval.

For Company Supplied (e.g., Radiological Areas)

If Seller personnel performs work in areas that are known to be contaminated or areas that are potentially contaminated with radioactive material, the Company will provide the required respiratory protection for all tasks requiring respirators. Company will provide respirators in accordance with the following:

- A quantitative fit test and respirator training will be performed by the Company's Respiratory Protection Program. Company will provide the Respirator Fit Test and Respirator Training, 4 Hours. Seller employee shall submit medical evaluation documentation per 29 CFR 1926.103, before starting the fit test and training. Company requires a minimum of one-week prior notification of initiation of work to schedule fit test and training. Only personnel with current Company General Respirator Training and a quantitative fit test can pick up respiratory protection equipment for project activity use. However, the Seller's S&H person or designated superintendent can pick up respiratory protection equipment for personnel other than themselves provided they have passed the requirements for Company Respirator Issuer Training.
- The number of personnel needing a respirator shall be submitted at least 48 hours before the scheduled need.

Company health physics (HP) personnel will check, appropriately tag, and segregate for disposal, all respirator equipment before it is removed from the site.

5.17 SANITATION

An adequate supply of drinking water shall be provided by the Seller. Portable drinking water dispensers shall be designed, constructed, and serviced to ensure sanitary conditions; shall be capable of being closed; and shall have a tap. Containers shall be clearly marked as to their contents and shall not be used for other purposes. Water shall not be dipped from containers. The common drinking cup is prohibited.

When sanitary sewers are not available, chemical toilets and hand-washing facilities shall be provided and maintained by the project.

5.18 SCAFFOLDING

The following are general requirements for construction, operation, maintenance, and use of scaffolds used in maintenance of buildings and structures and construction. Consult 29 CFR 1910.28 for additional requirements applicable to specific types of scaffolds used in general industry and 29 CFR 1926 Subpart L for construction.

- Provide fall protection for scaffolds over 10 feet in height in the form of guardrails or personal fall arrest systems.
- Ensure that working levels are fully planked.
- Ensure that scaffolds and associated components can support four times the maximum intended load.
- Provide fall protection for employees erecting or dismantling scaffolds where there is exposure to falls from a height of 6 feet or more whenever the installation and use of such protection is feasible and does not create a greater hazard.
- Provide scaffolds with guardrails, toe boards, and midrolls, as appropriate, for the type of scaffold used and the work to be performed.
- Erect scaffolds on sound footings or anchorage which is rigid and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.
- Do not load scaffolds in excess of the working load for which they are intended.
- Maintain scaffolds in a safe condition.
- Do not alter scaffolds or move them horizontally while they are in use or occupied.
- Damaged or weakened scaffolds shall be repaired immediately shall not be used until repairs have been completed.
- Provide an access ladder or equivalent safe access to the scaffold.
- Do not work on scaffolds during storms or high winds.
- Do not work on scaffolds which are covered with ice or snow, unless all ice or snow has been removed and the planking sanded to prevent slipping.
- Do not allow tools, materials, and debris to accumulate in quantities to cause a hazard.
- Secure scaffolds to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means. Do not use window cleaners' anchor bolts to anchor a scaffold to a structure.
- Ensure that protection is provided from falling objects such as hand tools, debris, or other small objects by installing toe boards, screens, debris nets, etc.
- Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift (29 CFR 1926 construction only), and after any occurrence which could affect a scaffold's structural integrity.

5.19 STAIRWAYS AND LADDERS

Ladders shall be used, inspected, and maintained in accordance with 29 CFR 1926 Subpart X, "Stairways and Ladders"; 29 CFR 1910 Subpart D, "Walking-Working Surfaces"; and the manufacturer's instructions. Ladders shall be used only for the purposes for which designed and shall be inspected.

Additional requirements for ladders used on or with scaffolds are contained in 29 CFR 1926 Subpart L, "Scaffolds."

5.20 STEEL ERECTION

Seller shall set forth requirements to protect employees from the hazards associated with steel erection activities involved in the construction, alteration, and/or repair of single and multi-story buildings, bridges, and other structures where steel erection occurs. Requirements shall be compliant with 1926 Subpart R, "Steel Erection."

Seller shall make certain to give emphasis to the following sections of Subpart R: 1926.750, 1926.752, 1926.754, 1926.755, 1926.757, and 1926.760.

5.21 WELDING, CUTTING, AND HOT WORK

The Seller should have a permit system addressing S&H and fire prevention for the following applications when work is conducted in an undesignated area: welding and allied processes, grinding, heat treating, thawing pipes with a torch or flame, torch-applied roofing, powder driven fasteners, hot riveting, and similar applications producing a spark or flame. Designated areas are permanent locations designed or approved for hot work operations to be performed regularly. Examples of hot work permits are contained in NFPA 51B. If the Seller does not have a permit system, then Seller shall be required to perform hot work using the Company's permit system. In all circumstances the Company reserves the right to issue a Company prepared hot work permit as necessary. Company requires 48 hours' notice to issue Company hot work permit. The Seller shall submit their permit system for Company's review and approval. The Seller may choose to follow the Company's procedure for hot work.

All hot work operations shall be coordinated with the Company Facility Manager/ CFR, or designee.

The supervisor of the work to be performed shall inspect the area to ensure that preparations are complete, safe conditions exist, and ensure that all listed precautions on the permit have been considered and checked as met or not applicable.

Welders and burners shall wear protective clothing that meets the requirements of ANSI Z49.1. The selected clothing shall be specified in the Seller's AHA for hot work activities. Fire watchers who may be exposed to the same hot work hazards as the welders and burners shall also wear the selected protective clothing.

If operations require welding/burning/hot work where anti-contamination clothing is required, Seller personnel shall wear flame-resistant clothing for all layers. Flame resistant clothing shall meet the requirements of NFPA 701. Fire watchers who may be exposed to the same hot work hazards as the welders and burners shall also wear the selected protective clothing.

A fire watch must be designated if any of the following conditions exist:

- A significant amount of combustible material is closer than 35 ft to the point of operations;
- A significant amount of combustible material is more than 35 ft away, but could be easily ignited by sparks;
- Hot work is conducted in areas where the employee must wear multiple layers of clothing and respiratory protection.

The fire watch shall be instructed to:

- Remain present in direct line of sight to the work area and perform no other activities other than fire watch duties;
- Be alert for any condition that could lead to a fire;
- Guard passers-by from welding hazards;
- Interrupt the work when a hazardous condition develops and deal with the situation appropriately;
- Ensure that appropriate fire extinguishing equipment is readily available and know how the equipment is to be used;
- Remain on the scene for at least 30 minutes after completion of hot work to detect and report a fire resulting from stored heat.

6. ENVIRONMENT PROTECTION AND WASTE MANAGEMENT

This section provides spill prevention and control and waste management requirements for on-site activities.

6.1 SPILL PREVENTION AND CONTROL

- Report all spills promptly to the CFR/Company Environmental Officer, who will determine the proper management and disposal. If the release is of a reportable quantity, the Project Manager will notify the appropriate regulatory agency.
- The Seller shall perform proper cleanup of accidental releases of materials. Cleanup is to be done by properly trained personnel. Hazardous waste from the cleanup must be packaged, transported, and disposed of by a licensed entity. The CFR must be given a copy of the hauler's manifest.
- Depending on the materials spilled, the CFR may require the Seller to hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be given to the CFR.
- For inside work, the Seller shall provide a spill kit, prevent spills to floor drains, and not discharge waste into any ORNL systems without approval.
- For outside work, the Seller shall provide a spill kit, inspect equipment for leaks, and repair leaking equipment in a timely manner.

6.2 WASTE MANAGEMENT

- Seller shall be responsible for all materials associated with their respective scope of work. As such, the Seller shall determine whether materials are wastes, and subsequently determine the proper management of those wastes. If the Seller plans to generate a hazardous waste (as defined by the Resource Conservation and Recovery Act, see 40 CFR 261.3) or generates a hazardous waste as the result of a spill of hazardous material, the CFR shall be contacted to determine proper management and disposal.
- Seller shall provide containers and/or transport vehicles for excess property for salvage, universal waste, sanitary/industrial waste, and construction/demolition debris.
- Waste Minimization principals shall be incorporated in all activities to ensure the greatest environmental benefits and minimize future liability for the waste that is generated.
- All work shall be performed in a manner that maximizes salvage and recycling and minimizes waste disposal to landfills.
- Characterization methods and procedures will be employed by all parties to the contract to ensure that the characteristics of the waste are known and adequately recorded during all stages of the waste management process.
- Seller shall be responsible for properly handling and disposing of all wastes generated.

7. WORK IN RADIOLOGICALLY CONTAMINATED AREAS

Seller working in areas known to be contaminated with radioactive material and/or areas or work operations having a potential of encountering radioactive contamination and/or exposure to ionizing radiation shall conform to the ORNL requirements for ionizing radiation protection. All necessary requirements shall be agreed to prior to starting work.

APPENDIX A: INCIDENT INVESTIGATION REPORT (EXAMPLE)

PART 1

Date of Incident:	Time of Incident:	Date of Investigation:
Company Contract Number:		
Location of Incident:		
Describe what the employee was doing at the time of the incident:		
Did injury result? Yes / No ____. If No proceed to Part 3	If yes☐ Employee Name(s) SSN(s)☐ Proceed to Part 2☐	

PART 2

Body part(s) affected:		
Disposition: Employee Sent to	☐ Doctor	☐ Employee refused treatment
Type of Injury:	☐ Emergency Room	Result impression
	☐ Personal Physician	☐ 1st Aid Only
	☐ On-Site Medical Station	☐ Medical Recordable
	☐ Other	☐ Lost Time or Restricted Duty
Employee Supervisor:		
Witnesses:		

Circle the Number Identifying Contributing Factors:

1. Absent/Improper Guarding
2. Defective Equipment
3. Weather/Temperature
4. Inappropriate PPE
5. Inadequate Housekeeping
6. Slippery/Uneven Walking Surface
7. Improper Layout of Work Area
8. Inadequate Ventilation
9. Inadequate Lighting or Noise Control
10. Improper Storage or Placement of Materials
11. Insect/Animals in Work Area
12. No At Risk Condition Identified
13. Other
14. Operating Without Authority
15. Improper Use of Equipment
16. Inadequate Procedures
17. Use of Defective Equipment/Tools
18. PPE Not Used
19. Inadequate Training
20. Improper Position or Posture
21. Horseplay
22. Altercation
23. No At Risk Act Identified
24. Other_____

_____

PART 3

How Did The Incident Occur?		
What Object or Substance was Involved?		
Any Previous or Similar Incidents?	Project Specific:	Company Wide:
What Factors Contributed to the Incident		

Was a HA developed for the task being performed? Yes/No____ If yes, attach a copy.

What **corrective actions** are being taken to prevent recurrence? Also list the person responsible for implementing and the target completion date for each item.

_____

_____

Supervisor/Investigation Team Members:_____

Name(s) Signature(s)/Date

Reviewed by: _____

Contractor Safety Representative/Date Program Safety Manager/Date

APPENDIX A: INCIDENT INVESTIGATION REPORT

WITNESS STATEMENT

Name: _____Title: _____

Date: _____ Time: _____

Temporary Address: _____Phone No. _____

Permanent Address: _____ Phone No. _____

_____

Location at Time of Incident: _____

Describe, to the best of your knowledge, what happened just before, during, and just after the incident:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signature _____

Attach to Incident Report