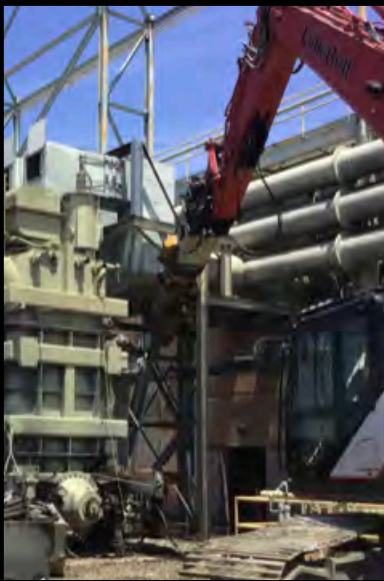


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# ***HEALTH AND SAFETY PLAN***

## **DEMOLITION OF THE IEEC POWER GENERATING STATION** ***Inland Empire Energy Company, LLC*** ***Menifee, California***



**POWER PLANT DECOMMISSIONING AND DEMOLITION EXPERIENCE THAT MATTERS**



**SILVERADO**  
**CONTRACTORS**

*Submitted to:*


**IEEC/ATC Group Services**  
**910 Louisiana Street, Suite 200B**  
**Houston, Texas 77002**

***January 30, 2020***

**COMPETITION SENSITIVE—SUBJECT TO CONFIDENTIALITY AGREEMENTS**  
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**INLAND EMPIRE ENERGY COMPANY, LLC**  
**26226 ANTELOPE ROAD**  
**MENIFEE, CALIFORNIA**

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## Signature Page

Prepared by:  \_\_\_\_\_  
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Approved by: \_\_\_\_\_  
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Approved by: \_\_\_\_\_  
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Approved by: \_\_\_\_\_  
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## Glossary of Terms, Acronyms, Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos Containing Materials
ANSI	American National Standards Institute
APF	Assigned Protection Factor
APR	Air Purifying Respirator
ASTM	American Society for Testing and Materials
oC	Degrees Centigrade
Cal/OSHA	California Occupational Safety and Health Administration
Carcinogen	A substance that can cause cancer
CCR	California Code of Regulations
CIH	Certified Industrial Hygienist
CFR	Code of Federal Regulations
CSP	Certified Safety Professional
dBa	A-weighted decibel
DERA	Designated Emergency Response Authority
ERP	Emergency Response Plan
oF	Degrees Fahrenheit
HEPA	High-Efficiency Particular Air
HIPP	Heat Illness Prevention Program
HSM	Health and Safety Manager
HSO	Health and Safety Officer
HASP	Health and Safety Plan
IEEC	Inland Empire Energy Center
IEEC/Others	Inland Empire Energy Center and its Assigns such as ATC
IIPP	Injury & Illness Prevention Program (California)
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
LO/TO	LockOut / TagOut
NIOSH	National Institute for Occupational Safety and Health
OBZ	Operator's Breathing Zone
OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
ppb	parts per billion
PPE	Personal Protective Equipment



ppm	parts per million
REL	Recommended Exposure Limit
ROPS	Rollover Protective System
SAR	Supplied Air Respirator
SCI	Silverado Contractors, Inc.
SDS	Safety Data Sheet
SSO	Site Safety Officer
SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TWA	Time Weighted Average





## Disclaimer

This Health and Safety Plan (HASP) and its provisions is to be applicable only to and for use by Silverado Contractors, Inc. (SCI) and its subcontractors. Any use of the HASP by other parties where SCI is conducting excavation and demolition operations and management or similar services without the express written permission of SCI will be at that party's sole risk and SCI shall have no responsibility thereto.

The existence and use of this HASP by SCI shall not be deemed an admission or evidence of any acceptance of any safety responsibility by SCI for other parties unless such responsibility is expressly assumed in writing by SCI as per a specific project contract. This HASP also establishes general safety requirements and procedures for the protection of project personnel to prevent injuries, illnesses and physical damage to equipment, supplies and property. This HASP is to be used in conjunction with applicable Cal/OSHA regulations, GE Gas Power Systems (GPS) Project Minimum EHS Standards (owner), SCI Health and Safety Program Policies and Procedures, and SCI / FBA Demolition Engineering Surveys, Work Plans and corresponding Job Hazard Analysis forms (JHAs).

## **1.0 PROJECT AND SITE INFORMATION**

### **1.1 Site Name and Address:**

Inland Empire Energy Center (IEEC) Demolition Project, 26226 Antelope Road, Menifee, CA 92585.

### **1.2 Site Background.**

The Inland Empire Energy Center (Project) is an existing natural gas-fired, combined-cycle generating facility located in Riverside County, California. The Project is owned and operated by Inland Empire Energy Center, LLC (IEEC), which is an indirectly wholly-owned subsidiary of General Electric Company. The project site is located in an unincorporated area of Riverside County near the town of Romoland. The project site has since been annexed into the City of Menifee, which is located approximately 30 miles southeast of the City of Riverside (Project Site).

The Project was permitted by the California Energy Commission (CEC) on December 17, 2003. Commercial operation began in June of 2009 with Unit 1. Operation of Unit 2 followed in May 2010.

The Project supplies electricity to the California Independent System Operator (CAISO) on a merchant basis. The Project sells both Local and System Resource Adequacy (RA) and bids daily into the merchant energy markets.

### **1.3 Project Site Description**

The Project occupies approximately 35 acres within the 45.8-acre Project Site. Approximately 24 fenced acres accommodate the power generation facility, a switchyard, a water treatment facility, storage tank areas, a parking area, a control room building, and two storm water retention basins. The remaining 11 acres of the 35 disturbed acres are comprised of landscaped areas and access roads.

Decommissioning and demolition laydown and parking areas will be located within the 45.8-acre Project Site, or on near-by leased parcels.

Prior to construction of the Project, the Project Site was disturbed cultivated agricultural land used for growing wheat. The areas surrounding the Project Site are also heavily disturbed and used primarily for industrial purposes.

Primary access to the Project Site is by way of Ethanac Road to Antelope Road.

## 2.0 Key Project Personnel Contact Information

The following key personnel are assigned to manage the IEEC project, and to also act as SCI emergency contacts in the event of an emergency.

<b>Name</b>	<b>Title</b>	<b>E-Mail Address</b>	<b>Phone Number</b>
<i>Bill Torres</i>	<i>Project Executive:</i>	<i>btorres@silveradocontractors.com</i>	<i>(510) 772-2911</i>
<i>Jimmy Saldivar</i>	<i>Project Manager:</i>	<i>jimmy@silveradocontractors.com</i>	<i>(714) 920-9669</i>
<i>Steve Bicknell</i>	<i>Construction Manager:</i>	<i>steveb@silveradocontractors.com</i>	<i>(415) 741-4164</i>
<i>Juan Navarrete</i>	<i>Project Safety Officer:</i>	<i>jnavarrete@silveradocontractors.com</i>	<i>(510) 414-5829</i>
<i>Mike Turpin</i>	<i>Operations Manager:</i>	<i>miket@silveradocontractors.com</i>	<i>(909) 203-0270</i>
<i>Miguel Ballesteros</i>	<i>Superintendent:</i>	<i>miguel@silveradocontractors.com</i>	<i>(909) 997-6079</i>
<i>Jesus Cabrera</i>	<i>Superintendent:</i>	<i>jcabrera@silveradocontractors.com</i>	<i>(510) 415-7560</i>
<i>Jose Moreno</i>	<i>Safety Director</i>	<i>jmoreno@silveradocontractors.com</i>	<i>(707) 834-7577</i>
<i>Michael Hernandez</i>	<i>Project Mgr. Assistant</i>	<i>mhernandez@silveradocontractors.com</i>	<i>(510) 851-0055</i>

### 3.0 Field Activities

#### 3.1 Scope of Work Major Project Tasks

##### 3.1.1 Preparatory Work by GE/Others

The Facility plans to shut down operations in Units 1 and 2 by January 1, 2020.

GE/Others will complete the following decommissioning activities prior to SCI work.

- *Drain all fluid systems and collect all contents to ensure public health and safety, and protection of the environment.*
- *GE is responsible for identification, removal, packaging, labeling, handling and disposal of all hazardous materials, universal and hazardous wastes, including, but not limited to, those listed below:*
  - *Fluorescent and mercury-containing bulbs;*
  - *Other metal-vapor bulbs and lamps;*
  - *PCB ballasts, rectifiers, and transformers;*
  - *Mercury-containing switches and instruments;*
  - *Smoke detectors;*
  - *Video display terminals/computer equipment;*
  - *Evacuation of refrigerant from HVAC equipment by a licensed HVAC entity;*
  - *Similar regulated materials (“universal wastes”);*
  - *Any other hazardous materials including flammables, corrosives or any other materials unsuitable for disposal as solid waste; and*
  - *Hazardous wastes.*
- *Isolate, disconnect, transport and stage on-site equipment components scheduled to be decommissioned and stored on-site listed as follows:*
  - *Generator Circuit Breakers (de-energized and locked out). These units will require disconnection and removal from the Unit 1 and 2 power blocks prior to facility demolition. These units will be staged on-site for future use;*
  - *(2) Gas Compressors (Tag #'s 9FG-C-01A/02A);*
  - *(4) Cooling Tower motors;*
  - *(2) Emergency Generators;*
  - *Fuel Gas Knockout Drum, Filter Separators, and Drain Tanks (Tag #'s 9FG- F-01A, 9FG-F-02A/02B, 9FG-T-01A/01B/02A);*

- *Air Compressors, Dryers, and Receivers (Tag #'s 11A-C-01A/01B, 11A-D- 01A/01B, 11A-D-02A/03A);*
- *Fin Fan Coolers (Tag #'s 9FG-A-01A/01B/01C); and*
- *CEMS HRSR PDC including calibration gases (2 x Quantity).*
- *Complete safe store activities associated with decommissioned equipment scheduled to remain in place;*
- *Isolate, disconnect, palletize/rig for off-site transport – equipment components sold for off- site liquidation/reuse;*
- *Identify and tag utility systems required for continued operation of remaining BESS infrastructure;*
- *Coordinate gas supply shutoff with SoCal Gas Company. Install blank on supply line. Purge fuel gas from fuel gas supply line that runs from knock-out and filtration skid through the bypass station and gas compressors to Units 1, 2 and the auxiliary boiler;*
- *Isolate, disconnect and de-energize facility from the switchyard;*
- *Label cabling within subsurface concrete duct banks that supports lower voltage station or standby service or needs to remain to support future BESS operations.*
- *Utilities such as natural gas, recycled water and non-reclaim waste water will be disconnected by GE and the facility will remain connected to the potable water and sanitary and storm sewer system. GE will disconnect the facility from the electrical switchyard. Residential electrical service supporting the admin/control building to remain.*

### **3.1.2 Scope of Work—Silverado Contractors (SCI)**

SCI will provide labor, equipment, materials, and permits to perform manual and mechanical demolition operations of certain IEEC features followed by backfill and grading activities. The primary features to be demolished include those listed below, and discussed in additional detail below:

- *Power Block*
- *Cooling Tower Area*
- *Administrative/Water Treatment Area*
- *Site backfill and grading*

#### **3.1.2.1 General Work Requirements**

The general work requirements are as follows:

- *Removal of support structures and pads within 12' of ground surface except where specifically excluded;*



- Removal of all above ground equipment, concrete pads, piping, electrical wiring and conduit, supports, brackets, hardware, and associated appurtenances;
- Removal of all below ground equipment, concrete pads, piping, wiring, conduit, supports, brackets, hardware and associated appurtenances within 12' of ground surface;
- Foundations will be retained for facilities and equipment scheduled to remain in place;
- ~~Power Block foundations will be removed to 4" below grade;~~
- Turbine pedestals, platforms and other elevated concrete power block structures will be removed to final foundation elevation;
- Power Block sump structures will be made porous then filled to final foundation elevation;
- Remaining concrete slab surfaces to be prepared so as not to leave a tripping hazard – all curbing and raised platforms to be removed, all bolts to be cut flush with pad surface.
- Pilings, if present beneath foundations scheduled for removal, will be cut immediately below the foundation and left in place.

#### 3.1.2.2 Asbestos Surveys

Asbestos surveys performed by IEEC/Others did not identify the presence of asbestos-containing materials (ACM) at the IEEC facility. The management, removal, or disposal of ACM is not anticipated in SCI's scope of work.

#### 3.1.2.3 Hazardous Materials Surveys

SCI may encounter small volumes of residual wastes during the removal of site features.

Wastes will be profiled in accordance with landfill requirements. Corresponding manifests will accompany waste shipments. Any regulated or hazardous wastes generated during SCI's activities will be disposed of in accordance with all applicable local, state and federal regulations.

#### 3.1.2.4 Material Handling

To the extent possible all materials generated during decommissioning and demolition activities will be assessed for recycling, salvage, reuse or use as on-site fill (e.g., processed concrete) in order to minimize waste generation.

All non-hazardous wastes including construction and demolition (C&D) debris will be collected and disposed of in permitted and approved landfills or waste collection facilities.

Any unanticipated suspect hazardous materials or conditions encountered during the work activities will be properly evaluated, with samples collected and submitted to an approved analytical laboratory for testing, if applicable.

All hazardous materials will be managed to protect human health and the environment.

## **3.2 Safety Management Responsibilities**

### **3.2.1 Project Executive**

Mr. Bill Torres is the Project Executive responsible for overall management of our project personnel at IEEC. He will develop and oversee our internal project-specific metrics and systems to ensure Silverado meets performance expectations. Bill has over 22 years experience performing high-hazard, heavy industrial demolition projects for commercial, industrial, and high-rise clientele and government entities. In addition, Bill is a licensed General Contractor with multiple classifications.

### **3.2.2 Project Manager**

Jimmy Saldivar is SCI's Project Manager (PM). Jimmy is an experienced demolition professional responsible to **ensures** that applicable constructibility inputs and appropriate Health, Safety and Environmental (HSE) requirements are integrated into our overall execution plans. He is responsible and accountable for specified metrics performance for all phases of work, and reports to the Project Executive.

The PM oversees and ensures that the execution of the various stages of the work are being performed satisfactorily by the applicable owner/supervisor of each stage. The PM:

- *Ensures compliance with the CEC approved Plan;*
- *Develops compliance reporting for CEC to document Plan compliance;*
- *Generates the monthly Contract Status Report;*
- *Initiates, develops, prepares / issues, and enforces adherence to the approved plans and procedures;*
- *Supports, provides input into, and generates / approves the following documents*
  - *Baseline demolition schedule and updates to ensure adherence to critical path activity dates and other project constraints; and*
  - *Daily construction reports, sharing significant deviations / concerns (and proposed solutions) with IEEC;*
- *Prepares Substantial and Final Completion Certificates – with regard to demolition work in the field for IEEC review; and*
- *Leads all constructibility reviews relating to the decommissioning and demolition of the Project.*

### **3.2.3 Site Superintendent(s)**



The Site Superintendent(s) has/have oversight and overall responsibility for the demolition activities. Specific assignments / activities include:

- *Supervises and directs the demolition team;*

- *Approves the monthly Contract Status Report prior to formal issuance;*
- *Initiates, develops, prepares / issues, and enforces project / site-wide adherence to the site plans and procedures;*
- *Supports, provides input into, and approves the following documents:*
  - *Baseline demolition schedule and updates to ensure adherence to critical path activity dates and other project constraints; and*
  - *Daily construction reports, sharing significant deviations / concerns (and proposed solutions) with the IEEC and the PM;*
- *Approves Substantial and Final Completion Certificates with regard to demolition / construction work in the field; and*
- *Inputs / attends all constructability reviews relating to the demolition portion of the project.*

### **3.2.4 HSE Manager/Site Safety Officer**

The HSE Manager (HSE, also referred to as the Site Safety Officer or SSO) ensures that all personnel supporting the project are educated in the applicable HSE processes.

At the Project Site the HSE/SSO shall be the key point of contact in terms of implementing the HASP by reviewing the work plans and JHAs in conjunction with the HASP and company policies and procedures, as well as observing any subcontractor safety practices.

### **3.2.5 Project Personnel**

All SCI personnel are responsible for taking all reasonable precautions to prevent injury to themselves and to their fellow employees. Personnel are required to review and fully understand the HASP, sign the Acknowledgment of Understanding form before beginning site activities, and implement the procedures and protocols specified therein. All accidents and any unsafe conditions or deviations from the procedures defined in the HASP must be reported to the SSO or PM.

Project personnel involved in on-site investigations and operations are responsible for:

- *Taking all reasonable precautions to prevent injury to themselves and to their fellow employees;*
- *Adhering to the requirements of this HASP;*
- *Performing only those tasks that they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the SSO or PM;*
- *Implementing the procedures set forth in the HASP, and reporting any deviations from the procedures described in the HASP to the SSO or PM for action;*
- *Notifying the PM and SSO of any special medical problems (i.e., allergies) and seeing that all on-site SCI personnel are aware of such problems;*

- *Reviewing HASP and signing Safety Plan Compliance Agreement; and*

### **3.2.6 Site Quality Assurance Manager**

The responsibility of the Quality Assurance Manager (QAM) is to ensure our work is planned, defined, and performed in compliance with the contract, specifications and regulatory requirements. The focus of the QAM is to work collaboratively with the PM to imitate proactive, preventative vs. reactive inspection to identify and correct problems before problems escalate.

### **3.2.7 Air Quality/Dust Control Supervisor**

The Air Quality/Dust Control Supervisor shall be a designated IEEC representative. The AQ/DCS shall monitor work conditions to ensure:

- *No fugitive dust from demolition activities is emitted beyond the property line;*
- *No dust emissions exceed 20 percent opacity from vehicle traffic;*
- *All active operations utilize applicable Best Available Control Measures*
- *All mobile off-road diesel-fueled vehicles are:*
  - Properly labeled with an Equipment Identification Number (EIN) issued by the CARB;
  - Properly registered in the CARB Diesel Off-road Online Reporting System (DOORS); and
  - Are part of a vehicle fleet that has a current CARB Certificate of Reported Compliance;
- *All mobile on-road diesel fueled vehicles operating at the Project Site are:*
  - In compliance with CARB requirements for on-road vehicles for the current compliance year;
  - Part of a fleet that has properly reported, as necessary, in the CARB Truck Regulation Upload, Compliance and Reporting System (TRUCRS) for which the fleet has a current Certificate of Reported Compliance; and,
  - Daily records are kept regarding the extent of active operations at the Project Site.
    - The nature of daily on-site demolition activities, including an estimate of the tons of various materials handled;
    - The amounts of diesel fuel consumed in each mobile off-road vehicle; and
    - The amounts of materials imported/exported to the Project Site.

### **3.2.8. First Aid Certified Personnel**

At a minimum, SCI site foreman and superintendents will be currently certified in first aid and CPR.


### **3.2.9 Qualified Demolition Supervisors**

All SCI demolition superintendents will have supervisor training and experience.



## 4.0 Employee Training

### 4.1 Project Initial Safety Orientation

All SCI site personnel, subcontractors and IECC and ATC project personnel are required to attend the project initial safety orientation. 

### 4.2 Employee Health and Safety Training

Although the IECC demolition project is not considered a hazardous waste site, some constituents involved with the demolition activities may present potential exposure to hazardous materials and may have met the requirements of Cal-OSHA CCR T8.

For hazardous waste operations, where applicable, (40) forty hours of initial offsite training (i.e. HAZWOPER) or its recognized equivalent; (8) eight hours of annual refresher training for all personnel (as required); (8) eight hours of Supervisor training for personnel serving as Site Safety Officers:

- *Demolition and Fall Protection Competent Person*
- *Excavation safety and excavation competent person*
- *Asbestos Supervisor / Worker or Awareness training (where applicable)*
- *Lead Supervisor, Worker or Awareness training (where applicable)*
- *OSHA 10 or 30 training certification*



## 5.0 Promotion of Safe Work Practices

### 5.1 Safety Policy

It is the policy of Silverado Contractors, Inc. that incident prevention shall be considered of primary importance in all phases of operation and administration. It is the intention of Silverado Contractors, Inc.'s management to provide a safe and health working conditions and to establish and insist upon safe practices at all times by all employees.

A copy of the SCI Safety Program, Site Specific HASP, IIPP, HIPP, Code of Safe Work Practices and safety Policies can be found onsite with the SCI Project Superintendent.

### 5.2 Management Accountability

Silverado Contractor's management is responsible for the safety and health of all its employees while they are carrying out their duties. Management's objective is an efficient, productive effort that incorporates all elements of accident prevention through management, project staff personnel, employees, subcontractors, and supplier participation.

### 5.3 Safe Work Practices/Standard Operating Procedures

#### 5.3.1 General

- *Eating, drinking, and use of tobacco are only allowed in designated areas.*
- *Alcohol consumption is prohibited during work hours.*
- *Use of prescription medications that impair judgement or affect motor skill and all illegal drugs are also prohibited.*
- *Behavior that could endanger the health and safety of any individual of the field team will not be tolerated. Any individual violating these requirements will be subject to disciplinary action that may include termination.*
- *Personnel will wash their hands thoroughly with soap and water prior to eating, drinking, or smoking.*
- *Where applicable, personnel will avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc.*
- *Avoid whenever possible kneeling, leaning or sitting on contaminated surfaces. Do not place monitoring equipment on potentially contaminated surfaces (i.e. the ground, etc.).*
- *All field crew members should remain alert to potentially dangerous situations in which they should not become involved (i.e. note the presence of strong, irritating or nauseating odors, etc.).*
- *Only those vehicles and the equipment required to complete work tasks should be permitted within the work zone. All non-essential vehicles should remain within the support zone.*

- *Spills should be prevented, to the extent possible. Should a spill occur, any liquid must be contained.*
- *Field crew members should be familiar with the physical characteristics of the site operations including:*
  - Accessibility to equipment and vehicles
  - Site access and nearest water sources
- *The number of personnel and equipment in the work zone should be minimized, but only to the extent consistent with workforce requirements for safe site operations.*
- *All personnel protective equipment will be used as specified and required.*
- *The buddy system will be used at all times when performing field activities and when working with new employees.*
- *Personnel are to immediately notify the Site Safety Officer or Superintendent if any unusual conditions are observed.*

### **5.3.2 New Employee Orientation**

All newly hired employees, regardless of their position are required to attend an initial project safety orientation prior to beginning their duties. This training includes a review of Silverado's site specific HASP, IIPP, Code of Safety Work Practices, jobsite policies, employee responsibilities, and review of job site hazards and controls.

### **5.3.3 Hazard Communications**

Jobsite hazards will be communicated to field personnel using various means, including, but not limited to:

- *Project Safety Documents—HASP*
- *Company Safety Documents—IIPP, Code of Safe Work Practices, Policies and Procedures*
- *Site Orientation*
- *Safety Data Sheets*
- *Sign/Labels*
- *Task-Specific Work Plans*
- *Job Hazard Analysis forms (JHAs)*
- *Toolbox Safety Meetings/Tailboard Meetings*

#### 5.3.3.1 Communication and Review of the HASP


All site personnel will review this HASP and sign a copy of the Safety Plan Compliance Agreement / Acknowledgement. The Superintendent will maintain these agreements at the site and place them in the project file at the conclusion of the operation.

Prior to the start of operations at the site and at the start of every new shift, the HSE/SSO will conduct and document a site safety briefing which will include all personnel involved in site operations. The initial safety meeting shall be in a controlled indoor setting and shall include all personnel involved in site operations. Subcontractors will be encouraged to contribute concerns and recommendations to improve site safety. At a minimum, the Site Safety Officer will discuss the following topics, as needed at the safety meeting:

- *Contents of this HASP*
- *Project scope of work*
- *Types of hazards at the site including heat stress and means for minimizing exposure to them*
- *Recognition of new unforeseen hazards discovered*
- *Daily lessons learned*
- *The type of monitoring that will be performed*
- *Action levels for upgrade and downgrade of personal protective equipment*
- *Personal protective equipment that will be used*
- *SCI Injury and Illness Prevention Program*
- *Site specific respiratory protection requirements*
- *Site control measures including safe operating practices and communication*
- *Location and use of emergency equipment*
- *Emergency Action plan - Evacuation signals and procedures*

#### 5.3.3.2 Safety Meetings

Various meetings are held throughout the course of a project to communicate safety expectations, and to proactively address safety concerns that may arise during the work.

- *Site Orientation - All persons working on the site are required to attend a safety orientation before starting any activities on site.*
- *Daily Toolbox Meetings are held every morning before work to address work assignments, to review the project work plans and corresponding JHAs, and to discuss the hazards and controls associated with tasks of the day.*
- All SCI site personnel including subcontractor personnel are  attend the toolbox meetings and to sign the briefing form prepared for that day's activities.

- Safety sign-in sheets will be filled out and sent to the Corporate Safety Department on a weekly basis.
- *Weekly Safety Meetings are held with management staff to review work progress and evaluate safety performance.*
- *Superintendent Safety meetings are held monthly to further review safety performance, and to address improvements or corrective actions.*
- *Company Officers attend project safety meetings on at least one active project per week.*
- *Additional safety meetings may be conducted whenever there are changes to work plans or JHAs, and/or if there are safety issues encountered that require discussion.*

#### 5.3.3.3 Safety Bulletin Board

Bulletin boards shall be conspicuously located for all employees. Information available at bulletin board locations shall include:

- *State and Federal Labor Law Posters*
- *Emergency Contact Information*
- *Hospital and Clinic Maps/Information*
- *SDS*

#### 5.3.4 Behavior-Based Safety

SCI utilizes a behavior based safety process that provides a higher level of safety excellence by promoting proactive responses, building ownership, and developing opportunities related to employee safety. A primary concept of a behavior based safety process is that most accidents are due to unsafe behavior, and that effective behavioral improvement can significantly reduce the exposures and risks contributing to accidents and injuries.

#### 5.3.5 Stop Work Authority

Any SCI employee at any time can STOP the work being performed by SCI and/or our subcontractors if observed unsafe acts or unsafe conditions or scheduled scope of work unplanned changes or if scheduled scope of work or not understood.

Employees should use their stop work authority if they witness an actual or potential unsafe condition at a Silverado jobsite. Then work will stop so the condition can be addressed with their Superintendent and remedied.

#### 5.3.6 Safety Enforcement

The majority of jobsite injuries are caused by unsafe acts and/or improper behavior.

SCI uses a progressive discipline process to inform employees when their conduct is unacceptable, and gives them an opportunity to improve their performance.





The purpose of progressive discipline is to encourage the development of consistent and fair practices throughout the company. However, the company reserves the right of disciplinary dismissal to protect the safety of employees.



## 6.0 Hazard Identification and Controls

### 6.1 *Pre-Work Conditions Assessment and Engineering Surveys*



Comprehensive pre-work site conditions assessment and formal engineering surveys are conducted by qualified, Competent Person(s). These assessments and surveys enable us to evaluate potential hazards and to develop the specific controls to prevent premature collapse, fire, or other conditions that may be identified.

The assessment and engineering survey findings are incorporated into our work preparations, equipment selection, work means, methods and controls, and documented in the subsequent task-specific work plans/JHAs.

Topics addressed in the pre-work assessments and surveys include, but are not limited to:

- *Bracing/Shoring*
- *Load Plans*
- *Access/egress plans, evacuation routes, muster points, emergency planning.*
- *Wall opening/access portals for equipment, personnel, debris management.*
- *Worker or public protections/systems*
- *Ventilation, illumination controls*
- *Unsecured Hazard Controls/Protections*
- *LO/TO protections*
- *Hazardous materials and combustibles handling, staging, removals*
- *Utilities and related protections for electric, gas, water, sewer, communication lines.*
- *Protect in place requirements/controls.*
- *Hoisting equipment/limitations*
- *Locations of pits or open holes/barricade requirements/protections.*
- *Locations of suspect materials or conditions*
- *Work progression inspection protocols/hold points.*
- *Emergency planning, access/egress, evaluation routes, rally points, signage*


### 6.2 *Subsurface Facilities and Utilities*

All piping and conduit that is within 0-12 feet below grade surface and is accessible (i.e., not located below foundations that are not removed) will be removed, except where specifically excluded or protected;

With the exception of cabling that supports lower voltage station or standby service, all cabling from underground concrete duct banks conduit will be removed and duct banks will be left in place with empty conduit;

Recycled water and non-reclaimable wastewater pipelines will be shut off by the Eastern Municipal Water District from street side valves. Recycled water and non-reclaimable waste water pipelines present on the project site will be removed if present within 0-12' below grade surface. Each pipeline termination point at the Project Site boundary will be secured with a 12" grout plug and blanked off with ASME type weld-end/weld-on caps or flanges. Fire, potable, service and sewer pipelines will remain to support future site operations;

Gas Service will be terminated by others at the boundary of the Southern California Fuel Gas metering station. Fuel gas supply line to be purged by others from the metering station through to the units and auxiliary boiler. Fuel gas supply system components including knock out and filtration skid will be removed by others. Remove above grade piping and piping between 0-12' below grade surface from the knock out and filtration skid to Units 1, 2 and the auxiliary boiler;

Drain lines located within the power block foundations will be capped in place through placement of a 12" grout plug and blanked off with an ASME type weld-end/weld-on caps or flanges.; 

The storm water drainage and retention system will be left in place and remain operable;

Sumps/basins located within 12' of grade will be removed entirely. Sumps located beneath 12' – remove walls to 12' BGS, perforate base to allow water drainage and fill; and




Other subsurface facilities that are located within 12' below grade surface and not identified above will be removed.

### **6.3 Power Block**

Unit 1 and 2 Electric Generating Units – demolish the entire above-grade structure including steel support structure and associated electrical components, building and contents. This includes the concrete superstructure including equipment pedestals and turbine deck as well as the following components and all associated systems, piping, electrical, controls, foundations/supports, and appurtenances:

- *Heat recovery steam generator (HRSG);*
- *HRSG stack (195 feet in height);*
- *Excitation transformer (disconnect/demolish without damage to concrete blast wall or concrete slab);*
- ~~*Power Block Concrete Slab – demolish/remove top 4" of concrete and reinforcing materials. Final concrete surface can remain in "rough" condition. Uncovered or partially uncovered horizontal rebar, mesh or reinforcing materials will need to be removed to avoid tripping and impalement hazard. Vertical rebar or reinforcing to be cut flush with final slab surface.*~~
- *Circulating Water System and Cooling Tower – Demolish and remove all systems and structures associated either directly or indirectly with the circulating water system and*

*cooling tower: Demolish and remove entire above-grade structure including structural members, fiberglass exterior panels, remaining cooling fans and motors, and electrical components and wiring. Saw-cut upper 6" of cooling tower basin wall and fill entire basin to grade surface using recycled, crushed concrete generated from this demolition project (all concrete generated to be processed on-site to a 2" minus material and used for backfill to fill the cooling tower basin to grade in accordance with project final grading and fill placement requirements. Components, structures, systems and associated appurtenances include but are not limited to the following:*

- Circulating water lines (~6' dia./OD, concrete lined)
- Remove circulating water line risers and manways to a depth of 12' below grade surface, install 24" concrete plug in remaining line and cap with steel cap, weld in place;
- Remove circulating water line laterals present within 12' of grade surface, install 24" concrete plug in remaining line and cap with steel cap, weld in place; 
- Laterals below power block or equipment foundations scheduled to remain on site do not require removal;
- Circulating water pumps;
- Cooling tower - Cooling tower basin walls will be removed to six inches below grade and the remaining basin will be filled to grade level with recycled concrete and clean fill and compacted; 
  - Cooling tower PDC; 
  - Ammonia storage tanks and feed skids; Acid storage tanks and feed skid; Cooling tower chemical feed area
  - Oil/water separator; Process water storage tank;
  - Wastewater sump with pumps;
  - Natural gas metering area;
  - Non-reclaim wastewater storage tank;
  - Non-reclaim wastewater pumps;
  - Shutdown circulating (circ) water pump;
  - Process water forwarding pumps;
  - Fuel gas preconditioning area;
  - Acoustic wall including panels, steel supports and concrete foundation.

## **6.4 Administration and Water Treatment Buildings**

Administration and Water Treatment Buildings and all internal components to remain and be protected during the project. Demolish all external systems and structures associated either directly or indirectly with the administration and wastewater treatment buildings with the

exception of utilities (potable water, sanitary and storm sewer, residential electric service) servicing these structures. Demolished materials to be sized appropriately on-site and transported for off-site disposal or recycling.

Pumps, piping, foundations and equipment/appurtenances associated with, and external to, the water treatment building;

- *Demineralized water tanks (2);*
- *Chemical area sump with pumps;*
- *Wastewater sump with pumps;*
- *Saturator make-up pump.*

### **6.5 Miscellaneous Items**

Demolish all systems and structures associated either directly or indirectly with the items noted below. Demolished materials to be sized appropriately on-site and transported for off-site disposal or recycling.

- *Auxiliary boiler;*
- *GT water wash supply skid;*
- *Chiller;*
- *Hazardous materials storage area.*

### **6.6 Final Grading and Fill Placement**

All areas excavated during demolition, or requiring fill placement to meet adjacent grade elevations, will be backfilled with existing site material, and imported clean engineered fill as required, to maintain the required site grade. This will include but not be limited to sumps, basins, and excavations for piping, conduit and structure removal.

The density of fill material will not be less than 93 percent of the maximum modified proctor density in accordance with American Society for Testing and Materials (ASTM) D1557, or not less than 95 percent of the maximum standard proctor density in accordance with ASTM D698. Fill in the upper twelve inches in the areas of the existing roads will be compacted to not less than 95 percent of the maximum modified proctor density in accordance with ASTM D1557, or not less than 98 percent of the maximum standard proctor density in accordance with ASTM D698. It is the responsibility of the Silverado to demonstrate compliance with these compaction requirements. At the completion of demolition, site grade will be returned to datum elevation as shown on existing drawings and sloped to existing storm water drains to prevent accumulation and ponding of rainwater.

### **6.7 Equipment Inspection**

Equipment inspection will be conducted and documented on a daily basis. Inspections shall include:

- *Heavy Equipment and Attachments*
- *Torch Set Up, Hoses and Gauges*
- *Wire Ropes and Rigging devices prior to use*

The following items shall be visually inspected for defects or hazards prior to each use:

- *Forklift Trucks, Aerial Manlifts, Scissor lifts*
- *Fire Extinguishers*
- *Hand / Power tools / Extension cords*
- *Safety Full Body Harnesses and Lanyards*
- *Respiratory Protective Equipment*
- *Wire Rope, Slings and Chains*
- *Come-Along and Chain Falls*
- *Other: Hoists*
- *Ladders*

## **6.8 Fire Prevention and Protection**

A separate, stand-alone *Fire Prevention Plan* (the Plan) has been prepared to reduce the risk of fire hazards during Silverado's work at IEEC. That Plan provides:

- *A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard.*
- *Procedures to control accumulations of flammable and combustible waste materials.*
- *The names of those persons responsible for maintaining equipment to prevent or control sources of ignition or fires.*
- *The name or job title of employees responsible for the control of fuel source hazards.*

Elements of the Plan designed to mitigate and control the potential for fire hazards include:

- *Daily jobsite and work area visual inspections will be conducted to ensure fire prevention and protection is implemented.*
- *Portable fire extinguishers on this project will consist of at least (1) one 20 lb. ABC rated extinguisher and additional as needed 10 lb. ABC rated extinguisher at or in each job box or meeting area. Where torch cutting is used, an extinguisher will be located at the torch cart. A charged water hose will be maintained at any torch cutting area and fire watch on duty as needed.*
- *Portable fire extinguishers will be maintained and inspected by the Project Superintendent and Lead Foreman on a daily basis.*

- *All employees will be given periodic training in the use of fire extinguishers.*
- *In the event a fire is started, all work will cease and workers in the vicinity will begin fire suppression. If, in the opinion of the lead person, the fire cannot be contained the crew will evacuate.*
- *The fire department will be notified of any fire, whether it has been suppressed or not.*
- *Access for water for fire prevention will also be in conjunction with the dust control methods. The source of water will come from the nearest hydrant with backflow preventer.*

## **6.9 Fall Protection Program**

The purpose of the Fall Protection Program is to identify, eliminate or control fall hazards to which employees will be exposed. This program applies to all jobsites where employees are exposed to fall hazards.

The program is detailed in the SCI Injury and Illness Prevention Program, Fall Protection Program Policy Number 8 provided in Attachment C.

## **6.10 Job Hazard Analysis and Mitigation**

Job Hazard Analysis (JHA) forms communicate *down to the field level* the work, hazards and the associated safe work practices required to perform the work safely.

Safety expectations are communicated using various program, project and task-specific Work Plans as noted above. However, the JHA process takes the higher-level requirements in these documents and pares them down to the task level so that we can identify and communicate hazards to the personnel responsible to physically deliver the work.

The JHA focus on those elements of the work that, if left uncontrolled, could result in an injury, illness, or damages. Identifying potential hazards and eliminating or controlling them will help prevent such harm.

The JHA focuses on the relationship between workers, the task, the tools and the work environment specific to that task. Once identified, controls to mitigate the identified hazards are implemented to eliminate the risks or reduce them to an acceptable level.

The JHA is reviewed and signed by applicable personnel, and reviewed at every tailgate meeting. Material changes to the work or any condition will require an update to the JHA, which is then communicated to personnel accordingly. Communication during our daily tailgate safety meeting is in English and in Spanish.

The JHA includes provisions for keeping our work zones safe, and for enforcing access controls to our work areas. For work areas within our work zone(s) that we control, we use delineators, danger tape, barricades, construction fence, and placards/signage to define areas under our control and related restrictions. Placards and signs indicate cautions commensurate with risks and/or OSHA-required postings.

We require that any person who enters into our work zones to sign in and out with the area Superintendent/Foreman, and be briefed on the work ongoing within that work area. No



person shall enter a Silverado regulated area without appropriate consent and/or escort, as appropriate.

If work in a particular area requires blended work forces (Work by Others), Silverado will work with GE to ensure all work is planned, documented, and communicated with the respective work forces through the tailgate process, and that the rules and expectations are identified and acknowledged through signature on the daily tailgate safety briefing form(s), and/ or the JHA, as appropriate.

### **6.11 Potential Chemical Hazards**

There are two categories of chemical hazards associated with site activities consisting of site constituents, and chemicals used to conduct the site work.

Site constituents are those chemicals which are known or anticipated to exist at the site. Many of the site constituents have been identified through previous investigations and site assessments. However, the potential exists for the presence of additional constituents not yet identified or quantified.

In addition to the site constituents, any chemicals that are brought on-site for use during decommissioning and demolition activities may be hazardous and are subject to regulation under Cal/OSHA Hazard Communication Standard CCR Title 8. Safety Data Sheets (SDS) shall be maintained for all chemicals present at the site. The HSM/SSO and Superintendent will be responsible for maintaining a complete and current SDS catalog at the site. The SDSs will be in a designated location on-site, typically on or near the project bulletin board.

Table 6.11-1 below presents potential or known site constituents that are or have may be present at the Inland Empire Energy Center (IEEC) Demolition work site. The table was compiled based on similar projects historical data and/or results information provided by IEEC project management / owner. *Note that asbestos is not suspected, but is listed as a potential hazard.*

Through additional investigations and assessments, additional constituents may be identified at the site. Concentrations and locations of any newly identified constituents shall be reviewed by the HSM/SSO to determine possible occupational exposures. The toxicity, physical properties, chemical properties and health hazards of each new constituent shall be assessing, and an SDS for the chemical included in the site catalog. All personnel working at the Site shall be briefed on each new constituent, its associated hazards, and precautions to be taken.

Information contained in the following table has been provided to establish a level of awareness for all personnel entering the Site. More specific information including chemical properties, incompatibilities, PPE selection and measurement methods is contained in the site SDS catalog, NIOSH Recommended Exposure Limits (REL), OSHA Permissible Exposure Limits (PEL) and ACGIH Threshold Limit Values (TLV). Air monitoring action levels and specific levels of PPE shall be based on the hazards associated with these compounds.



Table 6.11-1 - Potential Site Constituents

Chemical/ Material	OSHA PEL	NIOSH REL IDLH	ACGIH TLV	Health Effects /Target Organs
<del>Asbestos*</del>	<del>0.1 fiber/cm<sup>3</sup></del> <del>ST 1 fiber/cm<sup>3</sup>**</del> <del>**30 minutes</del>	<del>0.1 fiber/cm<sup>3</sup></del> <del>None</del>	<del>0.1 fiber/cm<sup>3</sup></del>	<del>Asbestosis, Mesothelioma (chronic exposure), interstitial fibrosis, restricted pulmonary function</del> <del>Respiratory system, eye irritant</del>
Carbon Monoxide	25 ppm	35 ppm C 200 ppm 1200 ppm	35 ppm	Headache, tachypnea, nausea, weak, dizziness, confusion, hallucination, cyanosis, depression, CVS, lungs, blood, Central Nervous System
Lead	0.05 mg/m <sup>3</sup>	<0.1 mg/m <sup>3</sup> 100 mg/m <sup>3</sup> 6 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	Central Nervous System, Gastrointestinal Tract, Eye Irritation, Kidneys, Blood
Silica, Crystalline (respirable dust)	Ca TWA 0.05 mg/m <sup>3</sup>	Ca [25mg/m <sup>3</sup> (cristobalite, tridymite; 50mg/m <sup>3</sup> (quartz, Tripoli)]	10 mg/m <sup>3</sup>	Cough, dyspnea (difficulty breathing), wheezing, irritation eyes, pneumoconiosis/Eyes, respiratory system, decrease pulmonary function, silicosis (potential occupational carcinogen)

Note: Table above indicated the Time Weighted Average (TWA) for each compound of concern, which is the average exposure workers have to a substance without experiencing significant adverse health effects over the standardized work period (an eight-hour a day, 40-hour per week work schedule).

\* [Note: Identified by NIOSH or Cal/OSHA as a potential occupational carcinogen. Survey information suggest no asbestos is on site at IEEC]

C—Ceiling exposure limit value; not to be exceeded]

[skin] – Danger of cutaneous absorption.

ST - Short term exposure limit, usually a 15-minute TWA

NA—Not available.

#### **6.11.1 Lead Based Paint**

Demolition operations may include work on materials painted with lead-based paint. In the event hot work cutting techniques are used to segment painted materials, we will follow Cal-OSHA protocols for torch cutting/controls. Work with lead-based paint will be conducted by lead trained workers, and initial exposure assessments will be conducted.

Engineering controls will include barriers/flagging and lead warning signs. All workers will don appropriate PPE.

Personal air pumps will be used to confirm that the respiratory protection is adequate.

Workers will be equipped with HEPA-vacuums and water misters to remove the loose and flaky lead containing materials.

Sanitation wash stations shall be provided for workers to use prior to eating meals or taking breaks.

All captured lead-based chips shall be properly disposed in a facility outside the State of California in accordance with applicable regulations.

#### **6.11.2 Dust Exposures/Dust Controls**

##### **6.11.2.1 Dust Exposures**

Demolition activities may create dust sources. This dust can become airborne and pose potential risks to worker visibility and possibly respiratory function. Water sprays are used to minimize or eliminate visible dust emissions and limit these to the boundaries of the work area. Dust masks and half-face APR's with HEPA filters will be available on-site for worker use, as needed.

##### **6.11.2.2 Dust Controls**

Silverado will utilize heavy equipment for demolition of structures, for processing and hauling of debris, to disturb the ground surface. In addition, there will be a host of vehicle/truck traffic on the site and related haul routes.

Precautions to minimize the exposure of nuisance and fugitive dust to employees and local citizens in the community will be accomplished through administrative and engineering controls along with protocols established in the stand-alone, site specific Dust Control Plan (DCP). Specific dust controls will further be described in the work plan and corresponding JHAs for tasks with the potential to create dust.

The DCP identifies key areas where there is potential for nuisance or fugitive dust, and the controls to be implemented to eliminate emissions. Controls typically focus on the use of water sprays from water trucks or misting devices.

Dust controls will be at the direction of the AQ/DCS or superintendents, and may be adjusted based on weather conditions. Caution will be used to not overspray and create muddy areas that could lead to slip hazards or difficulty for vehicles gaining traction. .

### **6.11.3 Asbestos Containing Materials (ACM)**

Asbestos surveys performed by IEEC/Others did not identify the presence of asbestos-containing materials (ACM) at the IEEC facility. The management, removal, or disposal of ACM is not anticipated in SCI's scope of work.

In the event suspect materials are identified, and either materials are presumed ACM or verified through sampling and analysis as ACM, modifications to various work plans, procedures, permits, notifications, JHAs, is required.

### **6.11.4 Carbon Monoxide Control**

The use of internal combustion equipment such as excavators, skid steer loaders, concrete cutters, generators, can produce carbon monoxide, a colorless, odorless, and toxic gas. All work at the Site is to be undertaken in well ventilated areas. In addition, any internal combustion equipment (i.e. skid steer loader) used on the interior demolition activities will be equipped with an exhaust scrubber.

## **6.12 Noise Hazards**

Project personnel may be exposed to noise levels in excess of the Cal/OSHA specified Permissible Exposure Limit (PEL) during some site activities including heavy equipment operations and loading out of demolition debris. The purpose of this procedure is to identify and protect employees and subcontractors, site employees and the general public from hazardous and nuisance noise exposures and to prevent hearing loss. SCI will also adhere to Cal/OSHA specified compliance regulations.

Hearing protection (ear plugs and/or ear muffs) is always available for all employees. During demolition hearing protection will always be required in the work area.

Minimize noise sources to the extent possible. Examples of controls that must be considered are as follows:

- *Addition or replacement of mufflers on motorized equipment*
- *Addition of mufflers to air exhausts on pneumatic equipment*
- *Following equipment maintenance procedures to lubricate dry bearings*
- *Isolation of loud equipment such as compressors and generators from employee work areas, site employee work areas, and adjacent neighborhoods*
- *Replacement of older noisy equipment with newer and quieter models*

### **6.12.1 Hearing Protection**

Hearing protection is required in locations where powered or motorized equipment or any other noise source can reasonably be expected to exceed 85 dBA. Protections may only be discontinued when noise levels are verified to be less than 85 dBA through a properly conducted noise survey.

Hearing protection shall consist of the following:

- *At least two (2) types of hearing protectors shall be available to employees and subcontractors, preferably an ear plug and/or earmuff type.*
- *Minimum Noise Reduction Ratings (NRR), hearing protectors issued to project personnel must meet the minimum NRR – ear plugs 29 dB and earmuffs 27 dB.*
- *Ear plugs and earmuffs may be used in conjunction to meet compliance requirements.*

#### **6.12.2 Noise Surveys**

Noise surveys may be conducted in a manner that reasonably reflects the exposure of the affected employees. The following devices may be used to determine employee exposure to noise sources. Sound level meters and audio dosimeters must be Type II (accurate to within +/- 2dB), operated in “slow” response, on the “A” scale, and calibrated to factory guidelines (including periodic factory re-calibration).

#### **6.12.3 Hearing Conservation Training**

All workers must be current on their Hearing Conservation Training. Training must include the following topics:

- *The effects of noise on hearing*
- *The purpose of hearing protectors*
- *The advantages and disadvantages of various types of hearing protectors*
- *The attenuation of various types of hearing protection*
- *The selection, fitting, care and use of hearing protection*
- *Audio-metric testing procedure*

### **6.13 Lock Out/Tag Out (LO/TO)**

The LO/TO process is designed to protect personnel from injuries by setting requirements for the control of hazardous energy sources. LO/TO procedures shall be in compliance with applicable regulations and company policies and procedures, including the following general procedures:

- *All equipment must be locked out to protect against accidental or inadvertent operation that could cause injury to people. Locks shall be applied and removed only by the authorized employee who is performing the servicing or maintenance. People must be authorized to perform lockout/tagout activities by their supervisors.*
- *No one should attempt to operate locked-out equipment.*
- *Lockout devices (padlocks) with an appropriate DANGER warning tag shall be used only for energy control.*
- *Before the servicing or maintenance of equipment a padlock and DANGER warning tag will be obtained from the Supervisor.*

- *Each padlock will be keyed differently with no master or duplicate keys.*

## **7.0 Personal Protective Equipment (PPE)**

### **7.1 Minimum Requirements for PPE**

The following minimum Personal Protective Equipment (PPE) is required for all site personnel when performing field work activities, heavy equipment operations, or other activities where hazards are known or suspected:

- *Work clothes to include long pants and shirt sleeves;*
- *Hardhat;*
- *Safety glasses with side shields (or impact resistant goggles);*
- *Face shield with safety glasses for grinding and related activities;*
- *Steel-toed leather work boots or chemical-resistant boot covers;*
- *Hearing protection in vicinity of noisy equipment;*
- *Work gloves and/or chemical-resistant gloves;*
- *Orange or yellow T-shirt, or traffic safety vest;*
- *For hot work / torch cutting operations ensure proper skin, eye and face protection, and*

PPE, including clothing, gloves and boots shall be inspected prior to and during use for:

- *Imperfect seams and defects;*
- *Non-uniform coatings;*
- *Wear and tear;*
- *Improper fit;*
- *Poorly functioning closures;*
- *Visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness; and*
- *Cracks or any signs of puncture or abrasion.*

Any reusable garments exhibiting any such characteristics will be properly discarded.

### **7.2 Respiratory Protection Program**

The purpose of the Respiratory Protection Program is to protect employees by establishing accepted practices for respirator use, providing guideline for training and respirator selection, and explaining proper storage, use and care of respirators.

SCI shall provide respirators to employees when respirators are necessary for health protection. Respirators shall be suitable for the intended purpose at no charge to affected employees. Any expenses associated with training, medical evaluations and respiratory protection equipment shall be borne by SCI.



The complete Respiratory Protection Program is provided in SCI Injury and Illness Prevention Program, Policy Number 20 provided in Attachment C.



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## 8.0 Medical Surveillance

All SCI site personnel are to participate in medical surveillance programs that meet the requirements of Cal-OSHA CCR T8. In addition, employees who are involved with torch cutting activities will also meet the medical requirement prescribed in Cal-OSHA.

Current copies of training certificates and statements of medical program participation for all SCI personnel are to be maintained by the local office. All personnel will be fit for duty.



## **9.0 SITE INFRASTRUCTURE, CONTROLS AND GENERAL RULES**

### **9.1 Smoking**

Smoking is not permitted inside IEEC Plant, smoking can only be outside IEEC Plant designated area

### **9.2 Eating Areas**

SCI is to provide shaded and clean areas for employees eating areas.

### **9.3 Sanitation Facilities**

#### **9.3.1 Emergency Eye Wash**

Where the eyes or body of an employee may be exposed to injurious or corrosive materials, suitable facilities for drenching the body or flushing the eyes with clean water shall be conspicuously and readily accessible. Access to emergency eyewash stations shall be kept clear. Emergency eyewashes shall meet ANSI Z358.1, providing 15 minutes of water flow operated hands free.

#### **9.3.2 Drinking Water**

On all jobsites, adequate drinking water (potable) water shall be provided. Drinking water shall be provided by one or more of the following:

- *Reusable containers for individual use*
- *Drinking fountains*
- *Single service cups*
- *Sealed one-time use water containers (water bottles)*

Water containers used to dispense water shall be clearly marked/identified and shall not be used for any other purpose. Portable containers used to dispense drinking water to more than one person shall be equipped with a faucet or drinking fountain. Drinking water containers shall be capable of being tightly closed and shall be otherwise designed, constructed and serviced so that sanitary conditions are maintained. Water shall not be dipped from containers.

Single use cups or personal containers shall not be shared. A trash can or similar shall be used to collect cups and containers to maintain housekeeping.

Non-potable water is not for drinking or human consumption and shall not be used for the purposes of drinking, washing, or food preparation.

### **9.3.3 Toilet Facilities**

A minimum of one separate toilet facility shall be provided for each 20 employees or fraction thereof of each sex.

Toilet facilities shall be kept clean, maintained in good working order, designed, and maintained in a manner that shall assure privacy and be provided with an adequate supply of toilet paper.

### **9.3.4 Hand Washing Stations**

A minimum of one hand washing station shall be provided for each 20 employees. Where there are fewer than 10 employees, and only one toilet facility is provided, the required washing facility may be located inside of the toilet facility. Washing stations shall always:

- *Be maintained in a clean and sanitary condition.*
- *Have an adequate supply of water for effective washing.*
- *Have a readily available supply of soap or other suitable cleansing agent.*
- *Have a readily available supply of single-use towels or a warm-air blower.*
- *Be located and arranged so that any time a toilet is used, the user can readily wash.*

Washing stations provided with portable toilets shall be located outside of the toilet facility and not attached to it. The washing stations shall have a sign or equivalent notice indicating the water is intended for washing. The washing stations shall also have an adequate supply of water for effective washing.

### **9.3.5 Temporary Offices**

Silverado will utilize offices within the existing Administration Building for the Project Manager and other supervisory personnel. Conex portable containers will be placed along the northern fence line just south of the Warehouse Building and will serve as foreman offices, tool/consumables supply storage and a scale house. A shaded area will also be provided as a lunch/cooling area for all field personnel.

SCI site superintendent and SSO will ensure safety equipment and safety stations are in place at various locations as need, such as first aid kits, eye wash stations and hand wash stations including employees PPE supplies and spill kits.

### **9.3.6 Communications**

SCI crew will have available for communication two way radio walkie-talkie, cellular and communication via verbal means

### **9.3.7 Site Access Controls**

The IEEC demolition project is a limited access site, with only approved authorized personnel of SCI and subcontractors authorized by SCI Site Superintendents. All personnel will sign in at the morning daily safety meeting.

Non-SCI personnel (i.e. visitors, etc.) will be required to check/sign in with the Superintendent Miguel Ballesteros / Jesus Cabrera. and be briefed on the site safety procedures before being permitted onsite. No visitors will be permitted into the work areas without an escort.

In the event of a regulatory agency inspection, employees will follow procedures for notification to management.

Where applicable, physical safety barriers will be installed as needed. Visible barriers such as plastic cones, safety delineators, or caution / DANGER red tape and safety signs may be required. Where applicable, construction fencing and signage is required around open excavations deeper than (4) four feet.

Only authorized project personnel with appropriate training and PPE shall be allowed within the work zones.

The Superintendent / Site Safety Officer will identify an appropriate location for emergency evacuation prior to the start of onsite activities. This area will be communicated to the SCI employees at the beginning of each work shift and to visitors upon their arrival to the site.

#### **9.4 Storm Water Pollution Prevention BMPs:**

SCI will install erosion controls/BMPs in its work areas to meet the objectives of the final SWPPP (prepared by IEEC/Others).

## 10.0 Decontamination Procedures

The level of decontamination depends on the nature and extent of contamination at work sites. Consequently, only minimal decontamination procedures are likely to be necessary. Level D PPE is anticipated to be the primary PPE ensemble. The HSO and/or HSM will be consulted if conditions change and upgraded PPE levels are utilized.

All workers shall wash hands thoroughly with soap and water before eating, and when exiting the work zone. Clean up the site, all site equipment, and then thoroughly wash hands and face when work activities are completed.

Field personnel must thoroughly decontaminate reusable PPE and other equipment after completing activities at the work site. Disposable PPE and other equipment will be discarded and properly disposed in plastic trash bags. Reusable equipment will be decontaminated by washing or a series of washings using an industrial detergent and water solution followed by a series of rinses using generous amounts of water. The rinse water will be collected in clean containers for appropriate disposal.

If chemical spills and/or related exposure potentials occur systematic sequential decontamination stations will be established where required. Decon stations shall be positioned to minimize the spread of contaminants. The subcontractor, in coordination with the PM and HSO, will be responsible for establishing and enforcing decontamination procedures and stations for his/her field personnel.

For equipment and material, the level of decontamination depends on the nature and extent of contamination at work sites. Consequently, only minimal decontamination procedures are likely to be necessary. Site HSO and superintendent will assess the level of decontamination required and ensure all equipment is clean as need prior to leave work site.

The PM will ensure that the subcontractor cleans and restores each site per contract requirements. The subcontractor will remove all debris, rubbish and other items from the site, and repair any damage as specified by contract requirements.

## 11.0 Spill Containment

SCI portable diesel tanks (vehicle tanks or field tanks, less than 120 gallons) are to be in double wall containers, 20# portable fire extinguisher is to be in place and grounding cables to be on tanks. Spill kits to be readily available near fueling areas and SSO will ensure that sufficient quantities of sorbent materials, pads, booms, pillows, and other cleanup materials and equipment in addition to rubber boots, coveralls, goggles, face shields, impervious gloves and other required personal protective apparel are available at the work site to abate, minimize and/or neutralize spills or releases of chemicals which are brought on site or utilized by SCI or subcontractor personnel. Work process must be coordinated to allow for timely and safe response for releases or spills.

To facilitate responses use and storage quantities of fuels, oils, other hazardous materials must be monitored by the SSO. Spills or releases of any quantity must be reported to the PM or SSO.

**ONLY TRAINED AND QUALIFIED PERSONNEL POSSESSING THE PROPER TOOLS AND EQUIPMENT ARE PERMITTED TO RESPOND, ASSIST, AND/OR FACILITATE IN THE ABATEMENT OR CONTAINMENT OF SPILLS AND/OR RELEASES.**

## 12.0 Confined Space Entry

Entry into any confined space is strictly prohibited unless an Entry Permit for Confined Space Operations in accordance with Cal/OSHA (T8 CCR 5156) and SCI and GE confined space permit requirements are met. Only currently trained personnel shall participate in confined space entry activities, (all non-trained personnel are prohibited from participation). The confined space entry supervisor shall prepare the entry permit.

The HSO shall be consulted prior to permit approval. Confined spaces for the purposes of this HASP includes: excavation/trenches containing volatile organic compounds or other off-gassing chemical constituents that may displace oxygen and/or limit ventilation, any spaces with openings with limited entry or egress that are not meant for continuous occupancy containing atmospheric hazards or any other recognized serious physical hazard. SCI confined space entry minimum requirements are outlined in SCI Safety Program.

## **13.0 Emergency Action Plan**

An Emergency Action Plan (EAP) facilitates and organizes employer and employee actions during workplace emergencies. Well developed EAPs combined with proper employee training may result in fewer and less severe employee injuries and less damages to equipment and facilities during emergencies.

The EAP takes into account the specific conditions of the site - it's layout, structural features, and emergency systems. Accordingly, the EAP may be modified and updated continually to address site changes as demolition commences.

### **13.1 Reporting Emergencies**

During the initial on-site safety meeting, the location of first aid/emergency equipment, telephone numbers, emergency communications, equipment emergency procedures, and evacuation routes shall be reviewed with all personnel. Subsequent arriving personnel shall receive identical information prior to beginning work. In addition to following the guidelines above, teams containing SCI employees will also carry emergency first aid kits in their vehicles.

SCI personnel are required to immediately report incidents to site superintendent.

All unplanned events, incidents, injuries, and emergencies will be punctually reported to the PM and HSO and SCI Health and Safety management and to GE and ATC site management.

### **13.2 Emergency Alarms**

Emergency alarms to be determine at job site prior to start field activities and ensure follow existing protocol at IEEC plant

### **13.3 Evacuation Procedures and Routes**

In the event evacuation of the site becomes necessary, all personnel shall meet at the designated project entrance or location, staging area on the Site Logistics Plan provided below. A head count will be taken to verify the presence of all employees.

All designated emergency exit areas by the general contractor will be mapped out and identified.

All project employees will be trained during the initial orientation phase of the project.



## 13.4 Rescue and Medical Duties

### 13.4.1 Mobile First Aid Responders

For non-medical emergencies, mobile first aid services may be used in case of minor injury/illness. The designated mobile incident response service is:

**ONSITE First Aid Responder**  
520 6th Street, Rodeo, CA 94572  
Telephone: (866) 998-2750

### 13.4.2 Non-Medical Emergencies

For non-medical emergencies the closest clinic is:

**Concentra Urgent Care**  
25115 Madison Ave., Murrieta, CA 92562  
Phone: (951) 600-9070 / M - F 8:00 AM – 7:00 PM





Directions to this facility are posted at the site in various locations, including the Safety Bulletin Board.

All personnel will provide updated emergency contact information to the SSO at the start of the project, and when contact information changes.

#### **13.4.3 Medical Emergencies**

For medical emergencies the closest hospital is:

**Menifee Valley Medical Center**  
**24800 McCall Blvd., Menifee, CA 92585**  
**Hospital ER Dept. phone (951) 672-7018 -**  
**Open (24/7)**

Directions to this facility are posted at the site in various locations, including the Safety Bulletin Board.

All personnel will provide updated emergency contact information to the SSO at the start of the project, and when contact information changes.

#### **13.4.4 First Aid-On Site**

In case of a minor injury (cuts, bruises), the first aid trained person will render assistance. For injuries requiring more than minor attention, the first aid person will make the worker as comfortable as possible and call Onsite Health and Safety or take the injured employee to the designated clinic. The first aid person will remain with the injured employee until the attending physician has completed diagnosis and will report back to SCI Project Manager and Safety Officer.

If an injury is major (broken bones, large lacerations, burns), 911 will be called for emergency assistance.

First aid certified personnel for this project are:

- *Miguel Ballesteros*
- *Jesus Cabrera*
- *Juan Navarrete*

### **13.5 Restarting Work Following an Emergency**

In the event of an incident and after attention and corrections implemented and corrected, site PM, superintendent and HSO will review and assess incident, inform all project personnel of incident and corrective actions to prevent from happening again, then will restart work.



### 13.6 Emergency Contacts

The emergency contacts for SCI are as follows:

<i>Name</i>	<i>Title</i>	<i>E-Mail Address</i>	<i>Phone Number</i>
<b>Police, Fire, Ambulance - Call 911</b>			
<i>Bill Torres</i>	<i>Project Executive:</i>	<i>btorres@silveradocontractors.com</i>	<i>(510) 772-2911</i>
<i>Jimmy Saldivar</i>	<i>Project Manager:</i>	<i>jimmy@silveradocontractors.com</i>	<i>(714) 920-9669</i>
<i>Steve Bicknell</i>	<i>Construction Manager:</i>	<i>steveb@silveradocontractors.com</i>	<i>(415) 741-4164</i>
<i>Juan Navarrete</i>	<i>Project Safety Officer:</i>	<i>jnavarrete@silveradocontractors.com</i>	<i>(510) 414-5829</i>
<i>Mike Turpin</i>	<i>Operations Manager:</i>	<i>miket@silveradocontractors.com</i>	<i>(909) 203-0270</i>
<i>Miguel Ballesteros</i>	<i>Superintendent:</i>	<i>miguel@silveradocontractors.com</i>	<i>(909) 997-6079</i>
<i>Jesus Cabrera</i>	<i>Superintendent:</i>	<i>jcabrera@silveradocontractors.com</i>	<i>(510) 415-7560</i>
<i>Jose Moreno</i>	<i>Safety Director</i>	<i>jmoreno@silveradocontractors.com</i>	<i>(707) 834-7577</i>
<i>Michael Hernandez</i>	<i>Project Mgr. Assistant</i>	<i>mhernandez@silveradocontractors.com</i>	<i>(510) 851-0055</i>

### 13.7 Emergency Drills

Once SCI personnel is onsite and after initial job walk, initial safety orientation and review of schedule scope of work and demolition procedures, hazards and controls, SCI site management will determine when to conduct emergency drills to ensure SCI site personnel respond properly in the event an emergency evacuation is required.

## **14.0 Management and Investigation of Incidents**

### **14.1 *Unsafe Act and Unsafe Condition Reporting and Investigation***

SCI will conduct initial safety orientation, review scope of work, hazards and controls and review SCI project HASP, JHA and SCI Safety Program documents (IIPP, Code of Safe Work Practices and Safety Policies, GE GPS Projects Minimum EHS Standards to help SCI project personnel to avoid unsafe acts and unsafe conditions and in the event of unsafe acts or conditions SCI employees are required to conduct behavior safe observations and report all incidents and accidents to SCI project management.

### **14.2 *Near Miss Reporting and Investigation***

“Near Miss” reports must be reported to the SSO and Superintendent immediately and submitted to PM and SCI safety management. Near misses are unplanned events that could have resulted in injury, property or equipment damage if there was a change in time or space.

### **14.3 *Incident Reporting and Investigation***

#### **14.3.1 *Standard Incident Investigation***

All site injuries and illnesses must be reported to the Site Safety Officer and Superintendent immediately following first aid treatment. The Site Safety Officer will notify the SCI Health and Safety management immediately. Incident reporting to IEEC owner and ATC project management personnel as soon as possible (same day)

Work is to be stopped until the Superintendent and/or Site Safety Office have determined the cause of the incident and have taken the appropriate action to prevent recurrence. Any injury or illness regardless of severity is to be reported.

#### **14.3.2 *Severe Incidents***

The HSE/SSO or a designated person will account for all personnel following a major incident, emergency and/or event (e.g., fires, explosions, and injuries). Immediate notification and request for assistance from emergency agencies will be coordinated by the PM or his/her designated person in the event of an emergency incident.

In the event of an environmental release, personal injury, or adverse event, project management will be notified as quickly as possible (see Emergency Contact Information phone list). The PM and HSO will ensure proper authorities are contacted by SCI management support team. The PM and HSO will ensure proper PPE is utilized and appropriate risk information is communicated to personnel. The PM will coordinate evacuation procedures with the assistance of SCI management. All unauthorized personnel will remain a safe distance from the emergency until the incident/area is determined to be safe for return to work conditions. At least four SCI site personnel are currently trained first aid/cardiopulmonary resuscitation (CPR) will be assigned to this project. The HSO will make every attempt to ensure at least one trained individual is on site during normal work hours.



## 15.0 Recordkeeping

The Superintendent, Project Manager and SSO are responsible for maintaining the project record. Electronic files will be maintained to the extent practical, with provisions made for access by IEEC/Others, as appropriate.

Prior to the start of work, they will review this HASP; if no changes are needed, they will sign the approval form (Project Manager) or acceptance form (Site Safety Officer) and forward a copy to the SCI Health and Safety Officer.

All SCI personnel will review the HASP and sign the Safety Plan Compliance Agreement attached. Copies of these forms will be maintained in the project file.

The Superintendent/Site Safety Officer will conduct a daily Site Safety Briefing in accordance with SCI procedures and have all attendees sign the Daily Safety Briefing form. Copies will be maintained in the project file.

Any incident or exposure incident will be investigated and the Incident Report form will be completed and forwarded to the SCI Health and Safety Officer.

All PPE use and changes, health and safety related issues and deviations from or problems with this HASP will be recorded and notified to SCI Health and Safety Officer.

Audits will be performed as described below. Audit shall be documented, with findings kept on file and reported to management with recommendations for improvements, corrective actions, or to report exemplary behaviors of personnel.

SCI will also develop task specific Job Hazard Analysis forms (JHAs) to be used during the tailgate safety meeting. The Site Safety Officer, Project Managers and Health and Safety Officer will routinely perform Health and Safety periodic audits during field activities. The SCI Site Safety Officer will conduct a site inspection prior to the start of each shift and inform the Project Manager or Site Manager to resolve discrepancies. Inspections are documented and placed in the project files.

## 16.0 Audits and Revisions

Health and safety audits assist in the continuous improvement of safety procedures. Audits identify risks, strengths and weaknesses in such procedures. In addition, audits assess if work is performed compliantly, or if changes are needed to get into compliance. Audits further identify if health and safety resources are being used effectively, or if changes are needed to process, plans or protocols. If changes are warranted to this HASP, measures will be taken to make the revisions and communicate changes to all personnel.

Superintendents are required to conduct daily visual site safety audits of all work areas under their supervision to identify and correct real and potential safety issues. When needed, the HSM/SSO and PM are engaged to address issues identified during the daily audit.

The SDM/SSO, QAM and other personnel may also conduct audits or inspections at any time during the course of the work. Audits shall be documented, with findings reported to management with recommendations for improvements, corrective actions, or to report exemplary behaviors of personnel.

GE representatives may also conduct audits or inspections at any time.

# ATTACHMENTS

## ATTACHMENT A—Example Forms



# JOB HAZARD ANALYSIS FORM

**PROJECT NAME / LOCATION:**

Job Task: \_\_\_\_\_ Date Prepared: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ NEW \_\_\_\_\_ REVISED \_\_\_\_\_

Location of Work Area (specific): \_\_\_\_\_ Developed By: \_\_\_\_\_

Company/Organization Performing Job: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

Field Superintendent Overseeing Job: \_\_\_\_\_ Approved By: \_\_\_\_\_

## Personal Protective Equipment (PPE)

<input type="checkbox"/> Reflective Vest <input type="checkbox"/> Hard Hat <input type="checkbox"/> Gloves <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Safety Shoes <input type="checkbox"/> Metatarsal	<input type="checkbox"/> Hearing Protection (Ear Plugs/Muffs) <input type="checkbox"/> Fall Protection Equipment  PPE Clothing <input type="checkbox"/> Coveralls <input type="checkbox"/> Rain Gear <input type="checkbox"/> Tyvek Suit <input type="checkbox"/> Fire Resistive <input type="checkbox"/> OTHER (specify): _____ _____	<b>RESPIRATORY PROTECTION:</b> <input type="checkbox"/> 1/2 face Air Purifying Respirator (APR) Particulate Filter PM100 _____ Cartridge Type _____ ..... <input type="checkbox"/> Full face APR Particulate Filter PM100 _____ Cartridge Type _____ ..... <input type="checkbox"/> Powered Air Purifying Respirator (PAPR) Cartridge Type _____ ..... <input type="checkbox"/> Air Supplied Respirator <input type="checkbox"/> Self Contained Breathing Apparatus (SCBA)	<b>ADDITIONAL PPE:</b>           
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Job Steps / Tasks	Potential Hazards	Protection / Procedure to Control Hazard

# JOB HAZARD ANALYSIS FORM

Hazards to Evaluate			
Permits/Clearances/Plans	Hazards		Safe Plan
Permits / Notifications			
Demolition Operations	Heavy Equipment	Work zone controls Barricades	Safety Signs
Utility Clearance Obtained	Falling debris	Communication with equipment operator	
Confined Space	Overhead Utilities	Power de-energization required	Insulation blankets required
Critical Lift		Required clearance distance =      ft.	Wire watcher required Safe work zone marked
Hoisting & Rigging Safety Review	Crane or other Lifting Equipment	Signalman assigned Tag lines in use	Area around crane barricaded
Boom Assembly and Breakdown		Lifting equipment inspected	Personnel protected from overhead load
Boom Proximity	Underground Utilities	Reviewed as-builts	Subsurface surveys
Concrete Structure Penetration		Required clearance distance =      ft.	Received dig permit Safe work zone marked by 811
Soil Excavation	Electrical	Lock Out/Tag Out/Try Out?	Permit required
Pneumatic Test		Reviewed electrical safety procedures	Confirm that equipment is de-energized Additional information below
Hot Work	Excavations (surface)	Permits Inspected prior to entering	Access/egress provided
Scaffolding Erection Plan		Barricades provided	Proper sloping/shoring Protection from accumulated water
Steel Erection/Decking/Flooring/ Grating Checklist	Fire Hazard	Permit Fire Extinguishers	Fire watch Adjacent area protected
Request for Shutdown		Unnecessary flammable material removed	Additional information below
Electrically Hazardous Work	Vehicular Traffic or Heavy Equipment	Traffic Barricades Cones	Flagger
Radiation Work Permit for Visitors		Signs Communication with equipment operator	Lane closure Additional information below
<b>Required PPE</b>	Noise > 85 dB	Hearing protection is required: Ear plugs	Ear muffs      Both
Hard Hat	Hand & Power Tools:	Inspect general condition GFCI in use	Guarding OK
Ear Plugs/Ear Muffs		Reviewed safety requirements in operators manual(s)	Additional information below
<b>Eye Protection</b>	Hand Hazards	List sharp tools, material, equipment	Additional information below
Safety Glasses		PPE gloves, etc.	
Face Shield	Manual Lifting	Protected sharp edges as needed	Identified material requiring lifting equipment Additional information below
Chemical Goggles		Reviewed proper lifting technique	
Welding Hood	Ladders	Hand protection required	Reviewed ladder safety training Proper angle and placement
<b>Hand Protection</b>		Inspect general condition before use	
Cut Resistant Gloves	Scaffolds	Ladder tied off	Tags in place Properly secured
Welders Gloves		Inspect general condition before use	
Nitrile Gloves	Slips, Trips, Falls	Toe boards used	Materials properly stored on scaffold
Surgical Gloves		Footings adequate	
Rubber Gloves	Pinch Points	Inspect for trip hazards Hazards marked	Work zone free of debris Tools & material properly stored
Electrical Insulated Gloves		Extension cords secured	
Arm Sleeves	Working w/Chemicals (fuels / lubricants)	List potential pinch points: Loader, Bobcat, Track mounted grapple, crane	Additional information below
<b>Foot Protection</b>		Work near operating equipment Hand/Body positioning	
Safety Toe Boots	Heat Stress Potential	Task creates potential contact with hazardous chemicals.	Reviewed SDS hazards and precautions
Rubber Boots and / or		Identify proper PPE (respirators, clothing, gloves, etc.)	
Rubber Boot Covers and / or	Cold Stress Potential	Shade Up (>85° F) High Heat Procedures (>95° F)	Cool down periods / break shaded area Sun Screen
Dielectric Footwear		Liquids available	
<b>Respiratory Protection</b>	Environmental	Water available	Reviewed Heat Stress symptoms Additional information below
Dust Mask (NIOSH) as needed		Proper clothing (i.e., gloves, coat, coveralls)	
Air Purifying Respirator as needed	Natural or Site Hazards	Reviewed Cold Stress symptoms Warm up periods	Wind chill (<32° F; 0° C) Additional information below
Supplied Air Respirator		Air emissions Water discharge	
SCBA	Overhead Work	Pollution prevention	Hazardous wastes Other wastes Waste minimization
Emergency Escape Respirator		Weather Terrain	
<b>Special Clothing</b>	Additional Information	Animals/reptiles/insects hazards	Adjacent operations or processes Biological hazards
Tyvek® / cotton coveralls		Caution barricade tape required	
Poly Coated Tyvek®	Fall Protection (as needed)	Rigid railing required	Danger barricade tape required
Fire Resistive		Covers over opening	
Rain Suit	Anchorage Point Available		Warning signs required
<b>Fall Protection (as needed)</b>			
Harness			
Double Lanyard Required			



## JOB HAZARD ANALYSIS CHANGE

PROJECT NAME / LOCATION:		
Job Task: _____		Date Prepared: _____
Page _____ of _____	JHA #: _____ (If applicable)	NEW _____ REVISED _____

Field Notes:

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TEAM MEMBERS SIGNATURE


The signature of the Supervisor certifies the completion of the Hazard Assessment and Safe Plan of Action by the crew.

Supervisor’s Signature: \_\_\_\_\_ Date \_\_\_\_\_

**DAILY SAFETY MEETING-TASK HAZARD ANALYSIS**

PROJECT NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

PROJECT #: \_\_\_\_\_

SUPERINTENDENT: \_\_\_\_\_

DAILY ACTIVITIESHAZARDSCONTROLS




**HAZARD IDENTIFICATION / CERTIFICATION**

<input type="checkbox"/> <input type="checkbox"/> Y N	<input type="checkbox"/> <input type="checkbox"/> Y N	<input type="checkbox"/> <input type="checkbox"/> Y N	<input type="checkbox"/> <input type="checkbox"/> Y N	<input type="checkbox"/> <input type="checkbox"/> Y N
<input type="checkbox"/> <input type="checkbox"/> ASBESTOS	<input type="checkbox"/> <input type="checkbox"/> LIFTING	<input type="checkbox"/> <input type="checkbox"/> ROADWAY / TRAFFIC WORK	<input type="checkbox"/> <input type="checkbox"/> HEAT OVER 95 F	<input type="checkbox"/> <input type="checkbox"/> PROCESS DEBRIS
<input type="checkbox"/> <input type="checkbox"/> SILICA /DUST	<input type="checkbox"/> <input type="checkbox"/> FALL FROM HEIGHTS	<input type="checkbox"/> <input type="checkbox"/> POISON PLANTS	<input type="checkbox"/> <input type="checkbox"/> SHARP OBJECTS	<input type="checkbox"/> <input type="checkbox"/> LOAD OUT
<input type="checkbox"/> <input type="checkbox"/> LEAD	<input type="checkbox"/> <input type="checkbox"/> FLAMMABLE MATERIALS	<input type="checkbox"/> <input type="checkbox"/> PINCH POINTS	<input type="checkbox"/> <input type="checkbox"/> CUTTING / GRINDING	<input type="checkbox"/> <input type="checkbox"/> WELDING / HOT SURFACES
<input type="checkbox"/> <input type="checkbox"/> HOT WORK / OPEN FLAME	<input type="checkbox"/> <input type="checkbox"/> HAND / POWER TOOLS	<input type="checkbox"/> <input type="checkbox"/> EQUIPMENT OPERATION	<input type="checkbox"/> <input type="checkbox"/> CONFINED SPACE ENTRY	<input type="checkbox"/> <input type="checkbox"/> INSECTS/SNAKES
<input type="checkbox"/> <input type="checkbox"/> WORK OVER / NEAR WATER	<input type="checkbox"/> <input type="checkbox"/> FLOOR / WALL OPENINGS	<input type="checkbox"/> <input type="checkbox"/> EXCAVATION / TRENCHING	<input type="checkbox"/> <input type="checkbox"/> CRANE / RIGGING	<input type="checkbox"/> <input type="checkbox"/> ANIMAL FECES / OTHER
<input type="checkbox"/> <input type="checkbox"/> OVERHEAD WORK	<input type="checkbox"/> <input type="checkbox"/> SLIPS / TRIPS / FALLS	<input type="checkbox"/> <input type="checkbox"/> HEAT / COLD STRESS	<input type="checkbox"/> <input type="checkbox"/> DEMOLITION OPERATIONS	<input type="checkbox"/> <input type="checkbox"/> _____
<input type="checkbox"/> <input type="checkbox"/> NOISE				

**HAZARD CONTROLS**PPE CERTIFICATION

<input type="checkbox"/> HEAD
<input type="checkbox"/> EYE
<input type="checkbox"/> FACE SHIELD
<input type="checkbox"/> HEARING
<input type="checkbox"/> RESPIRATORY
<input type="checkbox"/> HAND
<input type="checkbox"/> REFLECTIVE VEST
<input type="checkbox"/> FOOT
<input type="checkbox"/> BOOT COVERS (Metatarsal)
<input type="checkbox"/> FLOTATION DEVICES
<input type="checkbox"/> BODY - COVERALLS
<input type="checkbox"/> RAIN GEAR

MEDICAL

<input type="checkbox"/> FIRST AID KIT
<input type="checkbox"/> HOSPITAL MAP
<input type="checkbox"/> LOCAL CLINIC MAP
<input type="checkbox"/> CPR PROVIDER
<input type="checkbox"/> ER NUMBERS

LIFTING

<input type="checkbox"/> LIFT WITH LEGS
<input type="checkbox"/> TWO MAN LIFT

FIRE PROTECTION

<input type="checkbox"/> HOT WORK PERMIT
<input type="checkbox"/> FIRE WATCH
<input type="checkbox"/> HYDRANT ACCESS
<input type="checkbox"/> EXTINGUISHER INSP.

WELDING

<input type="checkbox"/> LENS/SHIELD
<input type="checkbox"/> SKIN/LEATHERS
<input type="checkbox"/> HOOD

HEAT ILLNESS

<input type="checkbox"/> WORK / REST
<input type="checkbox"/> REST / SHADED AREA
<input type="checkbox"/> WATER PROVIDED
<input type="checkbox"/> TRAINING
<input type="checkbox"/> MONITORING/OBSERVATION
<input type="checkbox"/> HEAT STRESS KIT

HIGH HEAT OVER 95 F

<input type="checkbox"/> BUDDY SYSTEM
<input type="checkbox"/> ADDITIONAL OBSERVATION
<input type="checkbox"/> SPECIAL MEETING

EXCAVATION

<input type="checkbox"/> TRAINING
<input type="checkbox"/> OSHA NOTIFICATION
<input type="checkbox"/> USA ONE CALL (811)
<input type="checkbox"/> COMPETENT PERSON
<input type="checkbox"/> SHORING
<input type="checkbox"/> SLOPING
<input type="checkbox"/> TRENCH BOX
<input type="checkbox"/> BARRICADES
<input type="checkbox"/> COVER

FALL PROTECTION

<input type="checkbox"/> DAILY INSPECTION
<input type="checkbox"/> FULL BODY HARNESS
<input type="checkbox"/> LANYARD/YO-YO
<input type="checkbox"/> ANCHOR
<input type="checkbox"/> RESCUE PLAN
<input type="checkbox"/> CONTROLLED ACCESS
<input type="checkbox"/> GUARDRAILS
<input type="checkbox"/> OPENING COVERS

CONFINED SPACE

<input type="checkbox"/> ISOLATION
<input type="checkbox"/> AIR MONITORING
<input type="checkbox"/> TRAINING
<input type="checkbox"/> PERMIT
<input type="checkbox"/> RESCUE EQUIPMENT
<input type="checkbox"/> RESCUE SERVICE

ELECTRICAL

<input type="checkbox"/> LOCK OUT / TAG OUT
<input type="checkbox"/> GFCI
<input type="checkbox"/> GROUNDING
<input type="checkbox"/> INSPECTION

SCAFFOLDING

<input type="checkbox"/> DAILY INSPECTION
<input type="checkbox"/> FALL PREVENTION RAILINGS
<input type="checkbox"/> ACCESS
<input type="checkbox"/> TIES
<input type="checkbox"/> FOOTING

HEAVY EQUIPMENT OPERATION

<input type="checkbox"/> DAILY INSPECTION
<input type="checkbox"/> SEATBELTS
<input type="checkbox"/> 3-POINTS OF CONTACT
<input type="checkbox"/> AWARE OF SURROUNDINGS
<input type="checkbox"/> GROUND COMMUNICATION
<u>SCISSOR / AERIAL BOOM LIFT</u>
<input type="checkbox"/> DAILY INSPECTION
<input type="checkbox"/> CLEAR OF DEBRIS
<input type="checkbox"/> ON STABLE GROUND
<input type="checkbox"/> SUITABLE LIFTING CAPACITY
<input type="checkbox"/> USE HARNESS FOR BOOM LIFT

VEHICLE / TRAFFIC

<input type="checkbox"/> TRAFFIC CONTROL PLAN
<input type="checkbox"/> BARRICADES
<input type="checkbox"/> CERTIFIED FLAGGERS
<input type="checkbox"/> SIGNS

LONE EMPLOYEE COMMUNICATION

<input type="checkbox"/> CELL PHONE
<input type="checkbox"/> RADIO
<input type="checkbox"/> OTHER _____

HOUSEKEEPING

<input type="checkbox"/> WORK AREA
<input type="checkbox"/> DUMPSTERS
<input type="checkbox"/> LAY DOWN AREA
<input type="checkbox"/> BREAK/SHADED AREA
<input type="checkbox"/> TOILETS / HAND WASHES
<input type="checkbox"/> LIGHTING
<input type="checkbox"/> PATH OF TRAVEL
<input type="checkbox"/> FENCE/BARRICADE

MISC

<input type="checkbox"/> SDS AVAILABLE
<input type="checkbox"/> SAFETY PLAN AVAILABLE
<input type="checkbox"/> CELL PHONE / RADIO
<input type="checkbox"/> BUDDY SYSTEM
<input type="checkbox"/> OXYGEN TANK STORAGE
<input type="checkbox"/> DUST CONTROL
<input type="checkbox"/> SHUT OFF VALVES MARKED
<input type="checkbox"/> PRESSURIZED LINES
<input type="checkbox"/> HOSE WHIP CHECKS
<input type="checkbox"/> FLAMMABLE STORAGE
<input type="checkbox"/> HAZ WASTE STORAGE

YOUR SIGNATURE ON THIS FORM MEANS THAT YOU HAVE REVIEWED AND UNDERSTAND THE CONTENT OF THIS SAFETY MEETING TASK HAZARD ANALYSIS.

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## SAFETY TRAINING

Project location: \_\_\_\_\_ Date: \_\_\_\_\_

Training conducted by: \_\_\_\_\_

Signature: \_\_\_\_\_

Safety topics discussed:

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I have read the Safety Topics covered above, and have been given the opportunity to ask questions so that I understand each of the listed Safety Topics. I agree to comply with each of these items while employed by Silverado Contractors, Inc.

Name	Signature	Company

## SAFETY MEETING ATTENDANCE, REST BREAK AND INJURY REPORT

This form is mandatory documentation of your attendance at our construction safety meeting, confirmation that you have taken all daily rest breaks, meal breaks, and that you have not suffered a work-related injury. Our company also requires that employees immediately report all work-related injuries or missed breaks to their supervisors; this form is verification that there has been no such occurrence.

Your signature on this form indicates that:

- You have attended and understand the content of the construction safety meeting.
- You have taken all daily rest breaks since our last tailgate meeting.
- You have taken all daily meal breaks since our last tailgate meeting.
- You have not suffered a work-related injury that has not yet been reported.

**\*If you do not understand any of the content discussed during the safety meeting, have not taken a rest break(s), or have an injury that has not been reported, before signing this form, please report it to your supervisor within 5 working days.**

Failure to report a work-related injury may delay or even prevent you from receiving your legally entitled workers' compensation benefits.

If you need medical treatment, even after regular working hours, you are required to see a company designated medical provider, unless you have previously filed a written notice that you have chosen your own provider.

Este documento indica que usted ha asistido a la Junta de Seguridad del Trabajo, que ha tomado todos sus descansos y períodos de la comida requeridos, y que no ha sufrido una herida causada por el trabajo. Según la Póliza de la compañía, es necesario que todos los empleados comuniquen cualquier herida sufrida en el trabajo a sus supervisores inmediatamente. Este informe verifica que usted no ha sufrido una herida causada por su trabajo.

Al firmar este informe, usted está indicando lo siguiente:

- Que usted ha asistido a la Junta de Seguridad en el trabajo y que ha entendido lo que fué discutido;
- Que usted ha tomado todos sus descansos requeridos desde la última Junta de Trabajo;
- Que usted ha tomado todos sus períodos de la comida requeridos desde la última Junta de Trabajo;
- Que usted no ha sufrido una herida en el trabajo, que no ha sido reportada a su supervisor.



Si usted no entiende lo que fué discutido durante la junta, no ha tomado todos sus descansos, o si usted sufre de una herida a causa de su trabajo, por favor, antes de firmar este informe, comuníquese con su supervisor dentro de 5 días de trabajo.

La falta de informar a su supervisor de una herida causada en su trabajo puede demorar o eliminar su derecho a recibir sus Beneficios de Compensación al Trabajador que están establecidas en la Ley.

Si usted necesita tratamiento médico, aún cuando no sea durante el horario de trabajo, es necesario que usted acuda con un(a) doctor(a) designado(a) por la compañía a menos que usted haya presentado notificación por escrito indicando que usted ha elegido su propio doctor.

Date / Fecha: \_\_\_\_\_ Jobsite / Lugar de Trabajo: \_\_\_\_\_

Supervisor: \_\_\_\_\_

Safety Topic / Tema Tratado: \_\_\_\_\_

PRINT NAME / ESCRIBA SU NOMBRE CON      SIGNATURE / FIRME:  
LETRAS DE MOLDE:

1. \_\_\_\_\_

2. \_\_\_\_\_

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8. \_\_\_\_\_

See other side for additional signatures.

PRINT NAME / ESCRIBA SU NOMBRE CON  
LETRAS DE MOLDE:

SIGNATURE / FIRME:

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**Location:** \_\_\_\_\_

**Inspector:** \_\_\_\_\_

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

	YES	NO	COMMENTS
<b>HOUSEKEEPING</b>			
The work place is clean and orderly. Materials stored properly			
Floors clear of boxes, paper, and in good repair			
Emergency Exit access clear of obstructions			
Aisles and passageways clear of obstructions			
Trash cans are emptied			
Kitchen and Break rooms clean			
Janitor's closet orderly			
Filing cabinet drawers kept closed			
<b>ELECTRICAL</b>			
Lights are in working condition			
Electrical cords stored properly			
Extension cords do not run through doors, windows, holes in walls			
Electrical outlets in good condition			
Areas in front of electrical panels clear for 3 ft.			
Circuit breakers are all labeled in panel box			
<b>SAFETY/FIRE</b>			
Check Fire Extinguishers (pull pin in place and secure, tag is current, extinguisher is charged)			
Safety signs posted and in legible condition			
First Aid supplies stocked			
All chemicals clearly marked/labeled			
Safety Manuals & SDSs available			
<b>MATERIAL HANDLING</b>			
Hand trucks and carts are in good condition			
Step stools and ladders in good condition			
<b>COMPUTER WORKSTATIONS</b>			
Chairs are in good condition			
Keyboards/pointing devices (mice) are at seated elbow height			
Monitors are in front of the computer user			
Additional Items:			

# SHOP SAFETY INSPECTION REPORT

Date: \_\_\_\_\_

Completed by: \_\_\_\_\_

<b>SAFETY PRACTICES</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>	<b>CORRECTION &amp; DATE</b>
Employees Wearing Required Safety Equipment				
Employees Using Adequate Foot Wear and Clothing				
Employees Following Safe Work Practices				
Hand Tools Properly Maintained & In Good Condition				
Storage Racks in Good Condition & Earthquake Safe				
Employees Aware of Safety Rules & Procedures				
Other Comments:				

<b>HOUSEKEEPING AND FIRE SAFETY</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>	<b>CORRECTION &amp; DATE</b>
Floors and Aisles Kept Clean				
Equipment & Material Properly Stored				
Work Tables and Benches Kept Neat & Clean				
Hazardous Materials Properly Stored and Labeled				
Electrical Panels Kept Clear (3 feet)				
Adequate Trash Receptacles Available				
Fire Extinguishers Accessible, Serviced & Tagged				
Exit Doors Accessible & Properly Marked				
Electrical Wiring, Connections, Boxes & Controls in Good Condition				
Other Comments:				

<b>GENERAL CONDITIONS</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>	<b>CORRECTION &amp; DATE</b>
Adequate Ventilation				
Flashlights Available and in Working Order				
Aisles Properly Marked				
Restrooms Clean and in Good Working Order				
Required Safety Signs Properly Displayed				
Elevated Locations with Guardrails & Load Posted				
First Aid Cabinet Properly Stocked				
Emergency Lighting in Good Working Order				
Other Comments:				

**N/A = Not Applicable**

# SHOP SAFETY INSPECTION REPORT (CONT.)

<b>MACHINERY AND EQUIPMENT</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>	<b>CORRECTION &amp; DATE</b>
Moving Parts of Machines and Equipment Guarded				
Points of Operation Properly Guarded				
Safety Controls and Devices Operating Properly				
Lock Out/Tag Out Procedures Followed When Required				
Compressed Gas Cylinders Secured				
Compressed Gases: Oxygen Separate From Fuel Gas				
Other Comments:				

<b>MATERIAL HANDLING EQUIPMENT</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>	<b>CORRECTION &amp; DATE</b>
Forklift Operators Certified				
All Forklifts Inspected Daily				
Genie Lift Inspected Before Use				
Employees Following Safe Work Practices				
Slings and Chains in Good Condition				
Storage Racks in Good Condition & Earthquake Safe				
Hoists and Cranes in good condition				
Other Comments:				

**N/A = Not Applicable**

## COMMENTS AND RECOMMENDATIONS:

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**Signature**

**Date**

Date of safety infraction \_\_\_\_\_

Employee involved in the incident \_\_\_\_\_

Employee's Department \_\_\_\_\_

Company safety rule(s) violated \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Corrective action taken by Superintendent

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Disciplinary action suggested as a result of this violation: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Employee's signature

Date

\_\_\_\_\_  
\_\_\_\_\_

Superintendent's signature

Date

\_\_\_\_\_  
\_\_\_\_\_

Copy to employee: (no) (yes)      Date presented \_\_\_\_\_



## CONFINED SPACE ENTRY PERMIT

Space to be Entered: _____		Permit No. _____	
Location/Description: _____		Purpose of Entry: _____	
Authorization Duration of Permit: _____	Date: _____	to: _____	
Entry Supervisor: _____	Time: _____	to: _____	
<b>PERMIT SPACE HAZARDS</b> (indicate specific hazards with initials) ____ Oxygen deficiency (less than 19.5%) ____ Oxygen enriched (greater than 23.5%) ____ Flammable gases or vapors (greater than 10% of LEL) ____ Airborne combustible dust (meets or exceeds LEL) ____ Toxic gases or vapors (greater than PEL or TLV) ____ Mechanical hazards ____ Electrical Hazards ____ Chemical Hazards ____ Engulfment ____ Other: _____		<b>EQUIPMENT REQUIRED FOR ENTRY</b> <b>AND WORK. Specify as required.</b> Personal Protective Equipment: _____ Respiratory Protection: _____ Atmospheric Testing/Monitoring: _____ Communication Method: _____ Permits: _____ Rescue: _____ Hand/Power Tools: _____ Blocking/Blanking: _____ Other: _____	
<b>PREPARATION FOR ENTRY</b> (Check after steps have been taken.) <input type="checkbox"/> Notify affected groups of service interruption. <input type="checkbox"/> Isolation Methods <input type="checkbox"/> Purge/Clean <input type="checkbox"/> Inert <input type="checkbox"/> Atmospheric Test <input type="checkbox"/> Blank/Blind <input type="checkbox"/> Lockout/Tagout <input type="checkbox"/> Barriers <input type="checkbox"/> Ventilate <input type="checkbox"/> Other: _____ <input type="checkbox"/> Personnel Awareness: <input type="checkbox"/> Pre-entry briefing on specific hazards and control methods <input type="checkbox"/> Notify contractors of permit and hazard conditions <input type="checkbox"/> Other: _____ <input type="checkbox"/> Additional Notifications required (Hot work Permit): _____		<b>AUTHORIZED ENTRANTS</b> (List by name or attach roster) _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
<b>RESCUE PERSONNEL/SERVICE</b> <b>RESCUE EQUIPMENT</b> Phone Number: _____ Contact Method: _____ Phone Number: _____ Contact Method: _____		<b>AUTHORIZED ATTENDANTS</b> (List by name or attach roster) _____ _____ _____ _____ _____	
<b>ATMOSPHERIC TESTING FREQUENCY</b> _____ Name of Atmosphere Tester: _____		<b>PERMIT CANCELLED BY (if required)</b> Date: _____ Time: _____ Reason for Cancellation: _____	



**SILVERADO**  
CONTRACTORS

## CONFINED SPACE ENTRY PERMIT

Testing	Result	Result	Result	Result	Result	Result	Result
Time (a.m./p.m.)							
Oxygen (%)							
Flammability (%)							
H <sub>2</sub> S (ppm)							
Toxic-(Specify)							
Cl <sub>2</sub> (ppm)							
CO (ppm)							
SO <sub>2</sub> (ppm)							
Temperature (°F/C)							
Other							
Tester Initials							

### AUTHORIZATION BY ENTRY SUPERVISORS

I verify review of this permit and verify that all necessary precautions have been taken to provide for a safe entry into and work in this confined space.

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

**THIS PERMIT MUST BE POSTED AT THE CONFINED SPACE.**

**THIS PERMIT EXPIRES AT THE END OF THE SHIFT ON WHICH IS WAS ISSUED.**

**A NEW PERMIT MUST BE ISSUED FOR WORK THAT CONTINUES INTO  
THE NEXT SHIFT.**





## AUTHORIZED ENTRANTS ROSTER

[illegible]



**SILVERADO**  
CONTRACTORS

## NON-PERMIT REQUIRED CONFINED SPACE WORK FORM

Space to be entered: \_\_\_\_\_ Location/Description: \_\_\_\_\_

Purpose of entry: \_\_\_\_\_ Permit Valid for (Date): \_\_\_\_\_

Supervisor Authorizing Work: \_\_\_\_\_

Print Name

Signature

Individuals Authorized to Perform Work (Signatures):

\_\_\_\_\_  
\_\_\_\_\_

I have evaluated the hazards of the above confined space and have determined  
that there are no hazards present. I have also made the required safety equipment  
available and instructed the authorized individuals accordingly.

Hazard Evaluator: \_\_\_\_\_ Date of Evaluation: \_\_\_\_\_

### ATMOSPHERIC TESTING

Acceptable:

Oxygen Deficiency/Enrichment	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ %	<u>19.5-23.5</u> %
H <sub>2</sub> S Vapors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	< 10 ppm
Hazardous Vapors/Gases	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	_____ ppm
CO Level Within Limits	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	_____ ppm
Explosive Atmosphere	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ %	_____ %

The proposed work requires the following:

Safety belt, lanyard and separate lifeline: ☐ Yes ☐ No

Lockout/tagout of mechanical equipment: ☐ Yes ☐ No

Other personal protective equipment: ☐ Yes ☐ No

If Yes, list

\_\_\_\_\_  
\_\_\_\_\_

Fire protection (if hot work conducted): ☐ Yes ☐ No

Attendant: ☐ Yes ☐ No

Other requirements:

\_\_\_\_\_  
\_\_\_\_\_



**SILVERADO**  
CONTRACTORS

## NON-PERMIT REQUIRED CONFINED SPACE WORK FORM

Space to be entered: \_\_\_\_\_ Location/Description: \_\_\_\_\_

Purpose of entry: \_\_\_\_\_ Permit Valid for (Date): \_\_\_\_\_

Supervisor Authorizing Work: \_\_\_\_\_

Print Name

Signature

Individuals Authorized to Perform Work (Signatures):

\_\_\_\_\_  
\_\_\_\_\_

I have evaluated the hazards of the above confined space and have determined  
that there are no hazards present. I have also made the required safety equipment  
available and instructed the authorized individuals accordingly.

Hazard Evaluator: \_\_\_\_\_ Date of Evaluation: \_\_\_\_\_

### ATMOSPHERIC TESTING

Acceptable:

Oxygen Deficiency/Enrichment	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ %	19.5-23.5 %
H <sub>2</sub> S Vapors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	< 10 ppm
Hazardous Vapors/Gases	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	_____ ppm
CO Level Within Limits	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ ppm	_____ ppm
Explosive Atmosphere	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Results _____ %	_____ %

The proposed work requires the following:

Safety belt, lanyard and separate lifeline: ☐ Yes ☐ No

Lockout/tagout of mechanical equipment: ☐ Yes ☐ No

Other personal protective equipment: ☐ Yes ☐ No

If Yes, list

\_\_\_\_\_  
\_\_\_\_\_

Fire protection (if hot work conducted): ☐ Yes ☐ No

Attendant: ☐ Yes ☐ No

Other requirements:

\_\_\_\_\_  
\_\_\_\_\_



Authorization No:		Date/Time Permit Valid:	
Competent Person:		Date/Time Permit Expires:	
Project Name:		Excavation/Trench Location:	
Description or Job Special Procedures:			
<b>UNDERGROUND SERVICE ALERT &amp; UNDERGROUND UTILITY OWNERS</b>			
Underground Service Alert contacted on:		Expiration Date:	
Extension Date:			
Inquiry identification number given by the Underground Service Alert		#	
Were all applicable utility owners contacted? (check below)			
<input type="checkbox"/> Communications	<input type="checkbox"/> Electric	<input type="checkbox"/> Gas	<input type="checkbox"/> Oil
<input type="checkbox"/> Sewer	<input type="checkbox"/> Water	<input type="checkbox"/> Other	
<b>ESTIMATED DIMENSIONS</b>			
Depth:	Top: W=	L=	Bottom: W=
			L=
<b>SOIL ANALYSIS METHOD(S) USED</b>			
<input type="checkbox"/> Visual	<input type="checkbox"/> Manual	<input type="checkbox"/> Tabulated Data	
<b>SOIL CHARACTERISTICS</b>			
<input type="checkbox"/> Cemented	<input type="checkbox"/> Cohesive	<input type="checkbox"/> Layered	<input type="checkbox"/> Dry
<input type="checkbox"/> Fissured	<input type="checkbox"/> Granular	<input type="checkbox"/> Plastic	<input type="checkbox"/> Moist
			<input type="checkbox"/> Saturated
			<input type="checkbox"/> Submerged
<b>SOIL TYPE</b>			
<input type="checkbox"/> Stable Rock	<input type="checkbox"/> Type A	<input type="checkbox"/> Type B	<input type="checkbox"/> Type C
Average Compression Strength=		tsf   Compressed Strength Data	
<b>MANUAL TEST USED</b>			
<input type="checkbox"/> Plasticity	<input type="checkbox"/> Thumb Penetration	<input type="checkbox"/> Ribbon	<input type="checkbox"/> Other
<input type="checkbox"/> Dry Strength	<input type="checkbox"/> Pocket Penetrometer	<input type="checkbox"/> Dry Testing	
<b>PROTECTIVE SYSTEMS</b>			
<b>Note:</b> Protective systems for excavations/trenches deeper than 20 feet (6.1 meters) must be designed and approved by a Registered Professional Engineer.			
<b>SLOPING/BENCHING</b>			
<input type="checkbox"/> Vertical (90°)	<input type="checkbox"/> 3/4:1 (53°)	<input type="checkbox"/> 1:1 (45°)	
<input type="checkbox"/> 1.5:1 (34°)	<input type="checkbox"/> 2:1 (26°)	<input type="checkbox"/> Other	
<b>SHORING</b>			
<input type="checkbox"/> Timber	<input type="checkbox"/> Trench Shield/Trench Box		
<input type="checkbox"/> Aluminum Hydraulic	<input type="checkbox"/> Tabulated Data Used		
<b>LIST OF KNOWN OBSTRUCTIONS</b>			
<input type="checkbox"/> Electrical	<input type="checkbox"/> Water	<input type="checkbox"/> Steam	<input type="checkbox"/> Drain
<input type="checkbox"/> Telephone	<input type="checkbox"/> Sewer	<input type="checkbox"/> Natural Gas	<input type="checkbox"/> Process
<input type="checkbox"/> Concrete Encasement	<input type="checkbox"/> Footings	<input type="checkbox"/> Other	<input type="checkbox"/> Alarm
			<input type="checkbox"/> Pilings
<b>OTHER</b>			
<input type="checkbox"/> Means of Egress Required		<input type="checkbox"/> Confined Space Permit Required	
<input type="checkbox"/> Mechanical Ventilation Required			
<b>SPECIAL INSTRUCTIONS AND WORK INSTRUCTIONS</b>			

All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be evacuated immediately, and no one is allowed to re-enter until corrective action has been taken.

**SIGNATURE AND DATES**  
(Project Manager shall determine which signatures are required)

	<b>Print Name</b>	<b>Signature</b>	<b>Date</b>
Excavation Competent Person (Required)	_____	_____	_____
Site Superintendent	_____	_____	_____
Safety Representative	_____	_____	_____
Registered Professional Engineer (if applicable)	_____	_____	_____
Other	_____	_____	_____

# DAILY EXCAVATION/TRENCH INSPECTION

<b>Competent Person:</b>	<b>Date/Time:</b>
<b>Project Name:</b>	<b>Weather Conditions:</b>
<b>Excavation Location:</b>	<b>Rainfall Amount (Past 24 Hours):</b>

N/A = Not Applicable

INSPECTION ITEM	YES	NO	N/A
<b>Access/Egress</b>			
Is access and egress located within 25 feet (7.6 meters) of entrants?			
If ladders are used, do they extend 3 feet (0.9 meters) beyond the top of the excavation?			
<b>Soil Characteristics</b>			
Is any water seepage noted in trench walls or bottom?			
Are pumps in place, or available if needed?			
Is there evidence of significant fracture planes in soil or rock?			
Are there any zones of unusually weak soils or materials not anticipated?			
Have tension cracks been observed along the top of any slopes?			
Are there any noted dramatic dips or bedrock?			
Is there any evidence of caving or sloughing of soil since the last inspection?			
<b>Protective Systems</b>			
Are slopes cut at design angle of repose? ANGLE=			
Are hydraulic shores pumped to design pressure?			
Is the shoring system installed in accordance with the design and tabulated data?			
Is the shoring being used secure?			
Are trench box(es) certified?			
Does the design include an adequate safety factor for equipment being used?			
Is traffic being adequately kept away from the excavation/trenching operation?			
Is vibration from equipment or traffic too close to the trenching operation?			
<b>Hazardous Atmosphere &amp; Confined Spaces</b>			
Is the hazardous atmosphere testing being conducted on a regular basis? (provide atmospheric test results on page 2)			
Have rescue procedures been established, and is equipment immediately available?			
<b>Miscellaneous</b>			
Are utility marking in place?			
Are trees, boulders, or other hazards located in the area?			
Are barricades or covers in place and in good condition?			



INSPECTION ITEM	YES	NO	N/A
<b>Miscellaneous (continued)</b>			
Is excavated material and equipment at least 2 feet (0.6 meter) from the edge of the excavation?			
Are GFCIs used on all temporary electrical cords?			
Is a valid excavation permit executed for the excavation/trenching activity?			
Is the excavation within the original scope of the excavation permit?			
Are daily safety briefings being conducted for employees associated with excavation activities?			
<b>Notes/Comments</b>			

**BUMP TEST**

Serial No.	Successful (Y/N)	Calibrated (Y/N)	User Initial

**ATMOSPHERIC TEST RESULTS**

*Where there is a reasonable possibility of an oxygen deficiency (less than 19.5% oxygen), combustible (gas in excess of 10% of the lower explosive limit) hazard, or other harmful contaminant exposing employees to a hazard, the atmosphere shall be tested. Air monitoring shall be performed before every entry into the trench and the results documented below.*

Time	O <sub>2</sub> (%)	LEL (%)	H <sub>2</sub> S (ppm)	CO (ppm)

**"I hereby attest that the following conditions existed and that the following items were checked or reviewed during this inspection."**

**All unsafe conditions must be corrected prior to excavation entry. If any hazardous conditions are observed, the excavation must be immediately evacuated, and no one is allowed to re-enter until corrective action has been taken.**

**Daily Excavation/Trenching Inspection Completed By:**

---

**COMPETENT PERSON SIGNATURE**

---

**DATE/TIME**

# HOT WORK PERMIT

**CAN THIS JOB BE DONE WITHOUT HOT WORK, OR IN THE SHOP?**

**IF NOT, ENSURE PRECAUTIONS ARE IN PLACE!**

**MAKE SURE SPRINKLERS ARE IN SERVICE IF AVAILABLE AND FIRE EXTINGUISHERS ARE READILY AVAILABLE!**

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks. This includes, but is not limited to, Brazing, Cutting, Grinding, Soldering, Thawing Pipe, and Welding.

*Note: The Required Precautions are not optional. They are required for fire-safe hot work. Please explain all "No check" responses below.*

## Instructions

The Permit-Authorizing individual must:

- Verify precautions listed at right (or do not proceed with the work)
- Complete and retain this page
- Give the second page to the person doing the work

## Who, When, and Where?

Hot Work Being Done by

- ☐ Employee  
☐ Contractor

Date

Job/Work Order No.

Location/Building and Floor

Nature of Job/Object

Name of Person(s) Doing Hot Work

I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for work.

**Signature of Permit-Authorizing Individual**

## Permit Expiration

Expiration Date

Expiration Time

- ☐ AM  
☐ PM

**Name of Assigned Fire Watch**

## Required Precautions Checklist

- ☐ Available sprinklers in Normal Automatic mode and valve open.  
☐ Hot Work equipment in good repair.

### Assess 35 ft radial "sphere" of work for potential fire hazards:

- ☐ Floors, work level and below, cleaned or protected.  
☐ All other combustibles removed or shielded from sparks.
- Clean horizontal surfaces (e.g. building structures, equipment, ducts, cable trays, etc.) above and below where possible.
  - Remove flammable liquids, dust, lint, combustible waste, oil deposits, etc., where possible.
  - If removal/cleaning is impractical, protect with fire-retardant covers, or shield with fire-retardant guards and/or curtains.
- ☐ Transmission or conveying of sparks to adjacent areas eliminated or protected.
- Tightly cover wall/floor openings with fire-retardant material.
  - Where openings cannot be sealed, suspend fire-retardant tarpaulins to help protect areas beneath.
  - Isolate or shut down fans and conveyors to prevent the capturing and conveying sparks to other areas.
- ☐ Explosive atmosphere eliminated or potential not present.

### Work on walls, ceilings or enclosed equipment:

- ☐ Construction materials verified as noncombustible and without combustible covering or insulation.  
☐ Combustibles on other side of walls relocated or protected.  
☐ Enclosed equipment cleaned and protected from all combustibles.  
☐ Containers purged of flammable liquids/vapors.

### Fire watch/hot work area monitoring requirements:

- ☐ Continuous fire watch provided during and for at *least 60 minutes* after hot work, including all breaks.  
☐ Fire watch supplied with suitable extinguishers/hoses.  
☐ Fire watch trained in the use of fire equipment and sounding alarm.  
☐ Area to be monitored hourly for a *minimum 6 hours* after job is completed, or longer if required.

### Other precautions that may be required:

- ☐ Fire watch provided for adjoining areas, above, or below.  
☐ Confined Space or Lock Out/Tag Out required/used.  
☐ Area smoke or heat detection disabled to eliminate false trip.  
Other: \_\_\_\_\_

Comments

**THIS PERMIT IS GOOD FOR  
24 HOURS ONLY!**





## ATTACHMENT B—Annual Permits



PROJECT HEALTH AND SAFETY PLAN (HASP)  
IEEC Power Generating Station  
IEEC, LLC/General Electric Power—Menifee, California  
January 30, 2020  
ATTACHMENTS

RECEIVED JUL 10 2019

No: **2019-907897**

## ANNUAL PERMIT

### Permit Issued To

(Insert Contractor/Project Administrator's Name, Address  
and Telephone No.)

Silverado Contractors Inc  
Attn: Safety Mgr or Amber Martinez  
2855 Mandela Pkwy 2nd Floor  
Oakland CA 94608-4011

(510) 658-9960

No. \_\_\_\_\_

Date 6/26/2019

Region 1

District 4

Tel. (510) 622-2916

Type of Permit D3-ANNUAL DEMOLITION

Pursuant to Labor Code Sections 6500 and 6502, this Permit is issued to the above-named employer for the projects described below.

State Contractor's License Number		Permit Valid through		
<b>782547</b>		<b>June 26, 2020</b>		
Description of Project	Location Address	City and County	Anticipated Dates	
			Starting	Completion
Various Conditions of Issuance:	Statewide		Jun 26, 2019	Jun 26, 2020

### This Permit is issued upon the following conditions:

1. That the work is performed by the same employer. If this is an annual permit the appropriate District Office shall be notified, in writing, of dates and location of job site prior to commencement.
2. The employer will comply with all occupational safety and health standards or orders applicable to the above projects, and any other lawful orders of the Division.
3. That if any unforeseen condition causes deviation from the plans or statements contained in the Permit Application Form the employer will notify the Division immediately.
4. Any variation from the specification and assertions of the Permit Application Form or violation of safety orders may be cause to revoke the permit.
5. This permit shall be posted at or near each place of employment as provided in 8 CCR 341.4

Received From	Received By		
Amber Martinez	Permit Unit		
<input type="checkbox"/> Cash	Amount	Date	
<input checked="" type="checkbox"/> Check 87001081	\$100.00	6/26/19	

Investigated by \_\_\_\_\_  
Safety Engineer Date  
*Amber Martinez* 6/26/2019  
Approved by \_\_\_\_\_  
District Manager/Permit Unit Date



No: 2019-905359

## ANNUAL PERMIT

Permit Issued To

(Insert Contractor/Project Administrator's Name, Address  
and Telephone No.)

Silverado Contractors Inc  
Attn: Safety Mgr or Amber Martinez  
2855 Mandela Pkwy 2nd Floor  
Oakland CA 94608-4011

(510) 658-9960

No. \_\_\_\_\_

Date 11/30/2019

Region 1

District 4

Tel. (510) 622-2916

Type of Permit T1-ANNUAL TRENCH/EXCAVATION

Pursuant to Labor Code Sections 6500 and 6502, this Permit is issued to the above-named employer for the projects described below.

State Contractor's License Number		782547	Permit Valid through		November 30, 2020
Description of Project	Location Address	City and County	Anticipated Dates		
			Starting	Completion	
Various Conditions of Issuance:	Statewide		Nov 30, 2019	Nov 30, 2020	

This Permit is issued upon the following conditions:

1. That the work is performed by the same employer. If this is an annual permit the appropriate District Office shall be notified, in writing, of dates and location of job site prior to commencement.
2. The employer will comply with all occupational safety and health standards or orders applicable to the above projects, and any other lawful orders of the Division.
3. That if any unforeseen condition causes deviation from the plans or statements contained in the Permit Application Form the employer will notify the Division immediately.
4. Any variation from the specification and assertions of the Permit Application Form or violation of safety orders may be cause to revoke the permit.
5. This permit shall be posted at or near each place of employment as provided in 8 CCR 341.4

Received From		Received By	
Amber Martinez		Permit Unit	
<input type="checkbox"/> Cash	Amount	Date	
<input checked="" type="checkbox"/> Check 87002955	\$100.00	11/30/19	

Investigated by \_\_\_\_\_ Date \_\_\_\_\_  
Safety Engineer  
Approved by  11/30/2019  
District Manager/Permit Unit Date



## ATTACHMENT C—Silverado Safe Work Practices



PROJECT HEALTH AND SAFETY PLAN (HASP)  
IEEC Power Generating Station  
IEEC, LLC/General Electric Power—Menifee, California  
January 30, 2020  
ATTACHMENTS

Silverado Contractors, Inc. is firmly committed to providing a safe place to work for each employee. Safety on the job in company facilities and at construction sites is of the utmost importance. No other aspect of the employee's work shall take precedence over personal safety. Silverado Contractors, Inc. shall not require an employee to work in an unsafe manner or in an unsafe environment.

Safety is everyone's responsibility. All operations shall be planned to prevent accidents. Our employees, as a condition of employment, shall comply with the applicable safety orders and all Silverado Contractors, Inc. safety programs.

Failure to comply with these safety regulations and programs shall lead to disciplinary action up to and including termination.

This Code of Safe Practices provides an overview of safety procedures at the jobsite. This Code of Safe Practices cannot cover every hazard that may exist. Employees should stop and ask the Superintendent if they have questions or need help. Employees shall always use good judgment and safe methods in doing their jobs.

The following general safety practices apply to all job locations.

1. Each employee shall follow safety rules, make every effort to work in a safe manner, and follow the spirit and the letter of the safety programs of Silverado Contractors, Inc.
2. Employees shall participate in safety meetings conducted by the Superintendent on a regular basis. These safety meetings are an essential part of the Silverado Contractors, Inc. safety program for protecting employees from accidents and illness.
3. Employees shall not use, possess, or be under the influence of intoxicants, alcohol, or controlled substances (drugs) on the job. Any employee reporting for work under the influence of intoxicants or drugs shall not be allowed to work and shall receive disciplinary action, up to and including termination. Employees shall report to their Superintendent the use of prescribed medication that has the potential to affect their safety on the job.
4. Fighting, gambling, horseplay and other misconduct shall not be permitted. Threatening another person, or any other act of violence on the job, shall not be tolerated.
5. Employees shall not be permitted to work when their ability or alertness is so impaired by fatigue, illness, or other causes that it might expose them or others to injury.
6. Employees shall not smoke on Silverado Contractors, Inc. jobsites or property.
7. Loose clothing and jewelry shall not be worn while working. It can catch on tools or equipment causing an injury.
8. Only qualified and trained personnel shall operate machinery. Employees shall not ride on equipment at jobsites. Employees shall not stand or sit on sides of moving machinery.
9. Employees shall keep the work area clean.

10. All injuries, no matter how slight, shall be reported to the Superintendent immediately.
11. Employees shall report unsafe conditions or practices to the Superintendent.
12. Every employee regardless of rank is empowered with "STOP WORK AUTHORITY". This means that any employee at any time can STOP the work being performed by Silverado Contractors, Inc. and/or our subcontractors.

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## AERIAL LIFTS

Aerial devices are vehicle mounted or self-propelled and use extending booms with attached buckets or platforms (e.g., cherry pickers, JLG lifts). Aerial devices shall be operated according to the manufacturer's instructions.



Only authorized operators trained in the safe operation of aerial lifts shall be permitted to use such equipment. Employees who will be elevated in the aerial lift shall have Fall Protection Training. Appropriate PPE (hard hats, fall protection) shall be worn during operation of aerial lifts.

The following safety practices apply to aerial lifts:

1. Aerial baskets shall not be supported or allowed to rest on or against any structure when employees are in the basket and in an elevated position.
2. Aerial lifts shall be at least 10 feet away from power lines.
3. Operators shall check the lift and its controls each day before use to determine that controls are in a safe working condition.
4. Employees shall always stand firmly on the floor of the basket and shall not sit or climb on the edge of the basket or use planks, ladders, or other means to gain additional height.
5. The elevated worker shall wear personal fall protection attached to the rated anchorage point provided by the manufacturer.
6. Employees shall inspect fall protection equipment before use. Employees shall not use damaged or broken fall protection equipment.
7. Basket or boom load limits shall not be exceeded.
8. When provided, outriggers shall be positioned on pads or a solid surface. All outriggers shall be equipped with hydraulic holding valves or mechanical locks at the outriggers.
9. Wheels shall be chocked, and brakes applied before using an aerial lift on an incline. The braking systems shall be set when elevating personnel with the vehicle stationary.
10. An aerial lift truck shall not be moved when the boom is elevated in a working position with employees in the basket except when all of the following are complied with:
11. The equipment is designed for this type of operation.
12. All controls and signaling devices are tested and are in good operating condition.
13. The route to be traveled is surveyed immediately before the work trip and checked for potential hazards such as:
  - Overhead obstructions
  - Traffic
  - Holes in the pavement, ground, or shoulder
  - Ditches, slopes, etc.

14. For areas other than paved, a survey shall be made on foot when moving.

These practices shall be followed:

- The speed of the truck shall not exceed 3 miles per hour.
- Do Not exceed the weight limit posted on the basket 1 or 2 people only.
- Except in case of emergency, lower level controls shall not be operated unless permission has been obtained from the employee in the device.
- Before moving an aerial device for travel, the boom(s) shall be inspected to see that it is properly cradled, and outriggers are in the stowed position.

## **Utility ALL-TERRAIN VEHICLES**

When all-terrain vehicles (UTVs) are used, employees shall follow these safety practices.

### **PPE for UTV**

Employees shall follow the manufacturer's recommendations, including wearing PPE:

1. Helmet – DOT compliant
2. Eye protection – safety glasses/face shield
3. Pants and long-sleeved shirt
4. Gloves
5. Work boots over ankle
6. Seat belts

### **Pre-Start Checks**

Before starting the UTV, employees shall:

1. Inspect the UTV visually, looking for obvious problems.
2. Check tire pressure (3-5 psi or visual check for sagging).
3. Check fuel level. The UTV shall not be running when the fuel level is checked.
4. Ensure head and tail lamps are working.
5. Ensure UTV is running properly. If the UTV is not running properly, notify the Superintendent and remove the key.

### **Common Hazards**

1. Injury when stepping on/off the UTV.
2. Rollover due to uneven terrain.
3. Exceeding a safe speed. The maximum speed for UTVs shall be 15 mph.
4. Collisions with fixed objects, people or other vehicles.
5. Burns due to contact with hot exhaust system.

### **Parking**

When parking the UTV, employees shall do the following:

1. Confirm the UTV is in a safe location.
2. Set the parking brake.
3. Turn tires into the hillside.



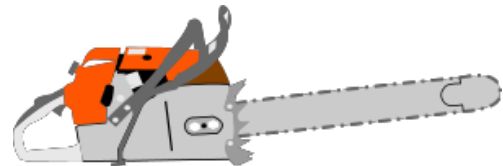
## UTV Operation

When operating UTVs, employees shall follow these safety practices:

1. Wear seat belts.
2. Do not use an UTV that is not operating properly. Remove the key and notify the Superintendent.
3. Do not allow passengers on the UTV unless the UTV is equipped with seats and seat belts.
4. Maintain safe operating speed (no more than 15 mph).
5. Be aware of other traffic.
6. Yield to all vehicles
7. Assume others do not see you
8. Be a defensive operator
9. Know the weight limit of the UTV.
10. Do not overload UTV racks.
11. Tie down any loose cargo.
12. Do not use cell phones while operating the UTV.
13. Tow equipment only if the UTV is specifically designed to tow.
14. Do not extend arms or legs outside of the operating position.
15. Do not use an UTV that is damaged, has missing guards, or is tagged out.

## CHAIN SAWS

Employees shall not operate a chainsaw without authorization from the Superintendent. Operating a chain saw is inherently hazardous: Control injuries by using proper PPE and safe operating procedures.



### Before Starting a Chain Saw

1. Check controls, chain tension, and bolts and handles to ensure that they are functioning properly and adjusted according to the manufacturer's instructions.
2. The chain shall be sharp, and the lubrication reservoir shall be full.
3. The saw shall be started on the ground or on another firm support. The saw shall not be drop started.
4. The saw shall be started at least 10 feet from the fueling area and with the chain's brake engaged.

### Fueling a Chain Saw

1. Approved containers shall be used for transporting fuel to the saw.
2. Fuel shall be dispensed at least 10 feet away from any sources of ignition. Employees shall not smoke during fueling.
3. A funnel or flexible hose shall be used when pouring fuel into the saw.
4. A saw shall never be fueled while running or hot.

## Operating a Chain Saw

1. Dirt, debris, small tree limbs, and rocks shall be cleared from the saw's path. Chain saw operators shall look for nails, spikes or other metal in the wood before cutting.
2. The saw shall be cut off or its chain brake engaged when the saw is carried on rough or uneven terrain.
3. Chain saw operators shall keep their hands on the saw's handles and maintain secure footing while operating the saw.
4. Proper PPE shall be worn when operating the saw, which includes hand, foot, leg, eye, face, hearing and head protection. Loose-fitting clothing shall not be worn.
5. Gasoline-powered chain saws shall be equipped with a protective device that minimizes chain saw kickback. To avoid kickback, operators shall not saw with the tip. If the saw is equipped with a tip guard, it shall be kept in place.
6. Chain saw operators shall watch for branches under tension since the branches may spring out when cut. Caution shall be taken that wood does not bind against the saw.
7. Employees shall not climb trees to perform a task.

## COMPRESSED GAS CYLINDERS

Compressed gas cylinders may be at the jobsite and used to store oxygen, acetylene, propylene, or acetylene.



These safe practices apply to compressed gas cylinders:

1. Cylinders shall be kept in an upright position and secured by chain, rack, bracket, or other means to prevent falling or rolling. Cylinders shall not be allowed to remain freestanding.
2. Cylinders shall not be dropped, dragged, or struck in any way.
3. Cylinders shall be transported only on carts designed for that purpose and with the valve safety caps in place and tightly screwed-on.
4. When cylinders are transported or moved while connected for use, the cylinder valves shall be closed, and the cylinders secured in place.
5. Cylinders shall not be lifted by their valve protection caps or with electromagnets.
6. When cylinders are hoisted by crane, the cylinders shall be secured to an approved cart or platform.
7. Employees shall not tamper with safety devices, such as safety rupture disks on valves or cylinders.
8. Valves shall be opened slowly with the valve outlet pointing away.
9. Do Not handle liquid oxygen cylinder's valve and or regulator, with hands or gloves containing petroleum-based products, this can cause and explosion.
10. Valves shall be closed when cylinders are not in actual use. The valve protection cap shall be securely in place whenever the cylinder is not connected.
11. Full and empty cylinders shall be stored separately. Full and empty cylinders shall be clearly identified and isolated.

12. Cylinders shall not be subjected to temperatures more than 125° F.
13. Fittings on regulators shall not be swapped. Every gas regulator is designed for a specific use. Only the correct regulator for the cylinder shall be used.
14. Cylinders of oxygen shall not be stored within 20 feet of cylinders containing flammable gases (such as acetylene) or highly combustible materials. If stored closer than 20 feet, oxygen cylinders shall be separated from fuel or flammable gas cylinders by a fire-resistant partition with a minimum of a one-half hour fire rating.
15. Cylinders shall be legibly marked to clearly identify the gas contained.
16. Fire extinguishers shall be on each torch cutting cart.

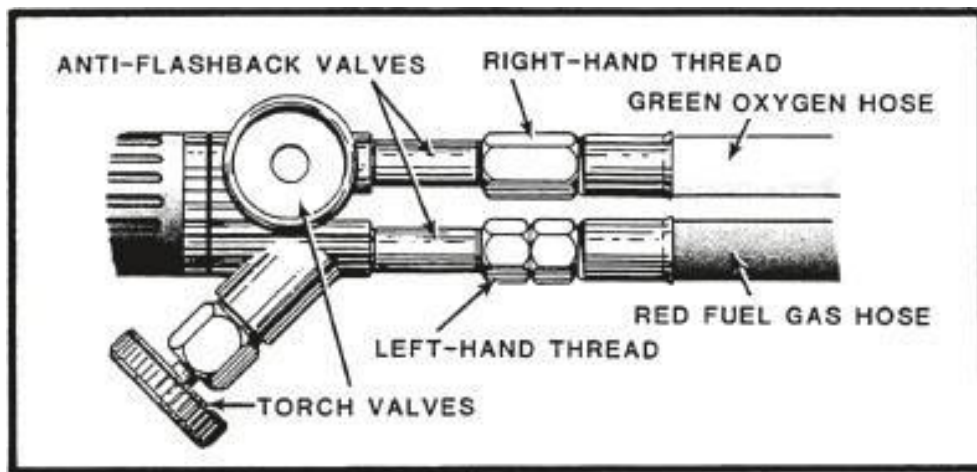
## CUTTING TORCHES

Cutting torches shall be treated with the respect deserving a fine tool, and not used as a hammer or tool. Pry bars and hammers shall not be used on any part of the cutting-torch system.

These safe practices apply to cutting torches:

### Cutting Torch Set Up

1. Once the regulators are in place, the hoses (red for fuel, green for oxygen) shall be connected and the torch attached. Fittings shall not be forced.
2. A hose shall be repaired or replaced at once if there are signs of wear.
3. Friction tape can be used to bind the hose together, but no more than 4 out of 12 inches of hose shall be taped.
4. Hoses shall be kept neatly coiled.
5. Flashback arrestors shall be installed at the torch and the compressed gas cylinder.
6. Only those torches and gas mixers approved by Factory Mutual or Underwriters Laboratories shall be used.
7. Torch-cutting valves and fittings shall not be oiled or greased.



## **Leak Test**

Perform a leak test to assure that fittings and valves are correctly seated:

1. The lines shall be pressurized, and a visual test completed.
2. Leaks shall be repaired.
3. When the valve on a fuel gas cylinder is opened, and there is a leak around the valve stem, the valve shall be closed, and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be stopped. The defective cylinder shall be properly tagged/labeled and removed from the work area. If fuel gas leaks from the cylinder valve and cannot be shut off, the cylinder shall be tagged and removed from the work area.

## **Cutting Torch Lighting**

The correct procedure for opening valves and lighting a cutting torch is:

1. Before opening either cylinder valve, the regulator adjusting valves shall be closed.
2. Open the fuel gas cylinder between 3/4 and one turn. If a detachable wrench is required to open the valve, leave the wrench in place whenever the valve is open. That way, the fuel gas can be shut off quickly in an emergency.
3. Stand away from the face of the regulator. Open the oxygen cylinder valve all the way. This prevents leakage around the valve stem.
4. Adjust the working pressures on the regulators. After moving away from the cylinders, open the fuel valve on the torch 1/4 turn and light the torch with a friction lighter. Do not light torches with matches or cigarette lighters.
5. Adjust the oxygen valve on the torch to set the flame.
6. A squealing sound means that gases have flashed back into the torch. Torch valves and cylinder valves shall be closed quickly to prevent fire from burning back into the hoses. Causes of flashback are improper pressures, kinked hoses, and loose, clogged, or overheated tips. The cause of the flashback shall be fixed before relighting the torch. Flashback arrestors prevent flashbacks and must be mounted at the torch and the tank.

## **Cutting Torch Use and Shutdown**

During short breaks, only the torch valves need be shut down. When the employee leaves the area, cylinder valves shall be shut off as well. At the end of a shift, the following shut-down procedure shall be followed:

1. Close torch valves, fuel gas first.
2. Next close cylinder valves, fuel gas cylinders first.
3. Open torch valves, then close to relieve pressure.
4. Remove regulators, hoses, and torch and store properly.
5. Place valve protection caps on the cylinders.

## **CONFINED SPACES**

Confined spaces:

- Are not primarily designed or intended for humans except for the purpose of work.
- Are enclosed or partially enclosed.
- Have a restricted means of entrance and exit by way of location, size, or means.
- Have poor natural ventilation or a hazardous atmosphere.
- May become hazardous due to design, materials or substances inside, or the work/activities being carried out inside.

### **Examples of Confined Spaces**

- Tanks
- Access shafts
- Utility vaults
- Sewers
- Pipes
- Truck or rail tank cars
- Boilers
- Manholes
- Silos
- Storage bins
- Ditches and trenches (may be confined spaces when access or egress is limited)
- Deep excavations on Bay mud

### **Hazards and dangers of confined spaces**

- Poor air quality
- Toxic gases
- Flammable atmospheres
- Mechanical, electrical, or physical hazards
- Loose materials that may engulf or smother

Silverado Contractors, Inc. has a Confined Space Program for activities in confined spaces.

No employee shall enter or work in a confined space without receiving training per the Confined Space Program.

## **CRANES AND RIGGING**

No employee shall operate hoisting equipment or use rigging unless properly trained and authorized.

Crane operators shall be properly certified to operate the equipment used.

Employees shall follow these safety practices when working around cranes:



1. Employees shall stay alert and aware of their surroundings at all times. Watch for moving equipment and cranes.
2. Do not depend on hearing a horn or other audible warning signal to know that equipment is backing up.
3. Employees shall position themselves away from the path of overhead operations.
4. Do not walk under loads or stand under crane booms or overhead operations.
5. Employees shall never place themselves between a suspended load and a solid object.
6. Employees shall warn others of moving or approaching overhead loads.
7. Employees shall not take for granted that the operator sees them and shall stay out of the operator's blind spot. If an employee cannot see the operator, the operator cannot see the employee.
8. Employees shall stay out of the swing radius of the equipment, so they are not hit. Do not cross barricades.
9. Do not attempt to distract signal persons/spotters or crane operators while they are performing their jobs.
10. Warning signs shall be obeyed.
11. Employees shall not ride on the load or hooks.

Crane operators shall follow these safety practices:

1. Ensure the crane is at least 10 feet away from overhead power lines.
2. Barricade the swing radius.
3. Know the weight of the load and the pick and set radius.
4. Know if you are in the structural or tipping portion of the chart.
5. Perform pre-operation inspection of crane.
6. Confirm crane is set up on firm supporting surface and outriggers are properly deployed. Level crane in all directions. Have tires off the ground.
7. Provide adequate cribbing as necessary.
8. Work to the strong side and ensure there are adequate parts of line.
9. Keep the load line vertical. Start, stop, and swing slowly.
10. Check the brakes when the load is first lifted.
11. Check for proper spooling.
12. Make necessary weight deductions for block, rigging, etc.
13. Allow for high wind which reduces ratings.
14. Do not run out of rope.
15. Do not two-block.
16. Do not leave the cab with a load on the crane.

17. Equipment shall only be worked on by authorized employees who are properly trained on applicable Lockout/Blockout procedures.

Employees rigging loads for crane operations shall follow these safety practices:

1. Know the weight of the load.
2. Know the center of gravity of the load. Make the load attachment above the center of gravity or stabilize.
3. Select hitch that will hold and control the load.
4. Know the rated capacities of slings and rigging hardware. Select the sling that is best suited for the load.
5. Inspect all rigging gear prior to use. Remove defective gear from service immediately.
6. Protect the sling from sharp edges.
7. Protect the load from rigging if necessary.
8. Do not use hand-tucked slings on single leg or with swivel in system.
9. Do not shorten slings or rigging using knots or bolts.
10. Allow for increased tension caused by sling angles.
11. Allow for low D/D ratios on wire rope.
12. Equalize loading on multiple leg slings.
13. Allow for reductions when using choker hitches.
14. Allow for sling angles when forcing choker.
15. Only use alloy chain when chain is used – Grade 8(T) or Grade 100.
16. Attach tag lines prior to lift.
17. Keep personnel clear of lift area.
18. Lift load a few inches and check rigging.
19. Know limitations of hoisting device.
20. Start and stop slowly. Maintain load control.
21. Watch for obstructions and powerlines.
22. Use proper hand signals.
23. Store rigging in a dry, oil-free place. Synthetic slings shall be stored out of direct sunlight.
24. Clean and maintain rigging per the manufacturer's instructions.

## **DEMOLITION**

1. Demolition is a hazardous task that requires knowledge and qualified supervision to prevent injuries.
2. Piping that may have been used to convey or store hazardous chemicals, gases, explosives, or flammable materials must be tested and purged. If you do not know that a pipe is safe to work on, stop and ask your superintendent. If you find pipe covering insulation or other materials, make sure that it is not asbestos or if it is, has been abated properly.
3. Walls which serve as retaining walls or ground sur charge on retaining walls / building basement walls to support earth or adjoining structures shall not be demolished until the hazard for moving ground has been eliminated by sloping, shoring, or underpinning. Make sure walls will withstand the imposed load. During demolition, watch to make sure that any

hazards resulting from weakened or deteriorated floors or walls will not pose an injury hazard. Exterior wall openings and all floors shall be protected to a height of not less than 42 inches, except on the ground floor and the floor being demolished.

4. Walkways: Ramps or runways must be erected for access, not less than 20 inches in width and secured and supported to avoid springing action. Securely fastened cleats or other means shall be installed on inclined runways sloped at 2 feet and 10 feet or more to improve footing. Planks used for raised walkways or runways shall be secured against displacement and all exposed ends will be provided with beveled cleats to prevent tripping.
5. Access: Stairways as a means of access shall be maintained clear for use within two floors or 24 feet of the demolition work above. Ladders shall be provided for the remaining two floors. Other accessways shall be entirely closed off at all times.
6. Mechanical Equipment: Mechanical equipment shall not be used on floors or working surfaces unless your superintendent has determined that the floors can hold the load. Where mechanical equipment is used for demolition work, floor openings shall have curbs or stop blocks to prevent equipment from running over the edge.
7. Falling Debris: All persons on demolition projects shall be protected from falling materials at entrances to multi-story structures by sidewalk sheds or canopies or both. Protection must extend from the face of the building for a minimum of 8 feet. Where hazards exist from glass, all glazed openings shall be removed at least one floor below the working level of demolition. When demolishing floors and roofs, limited access shall be given to cleanup crews other personnel shall be prohibited from working below this activity. Demolition of floor spaces shall continue until all unsupported flooring is removed. When employees must remove floor support beams or wall sections by hand, scaffolding or elevating work platforms and aerial devices shall be provided and used.
8. Debris Removal: All salvage of materials must be conducted before demolition starts. All materials displaced shall be transported immediately to the ground. If materials are to be stored in the structure, a qualified person, your superintendent must determine it is safe to do so.
9. Demolition of exterior walls and floor construction shall begin at the top of the structure and then go down. Each story of exterior wall and floors shall be removed and dropped into the storage space below before starting the removal of exterior walls and floors in the story next below. All scrap lumber and waste materials shall be removed from the immediate work areas as the work progresses. Dumping outside of the building or exclusion zones requires approval from management not field personnel.
10. Chutes: Whenever waste material is dropped to any point lying below or laying outside the exterior walls of the building, enclosed chutes shall be used. Signs must be posted to warn of the hazards of falling debris. Chutes at an angle of more than 45° from horizontal shall be entirely enclosed. Openings shall not exceed 48 inches in height measured along the wall of the chute. On all stories below the top floor, such opening shall be kept closed



- when not in use. If chutes clog or stoppages occur, employees shall not remove material from the chutes with their hands. Picks or other tools shall be used to free clogs. Any chute opening into which employees dump debris by hand shall be protected by a guard rail to prevent falling into the chute. Where material is dumped from mechanical equipment or wheelbarrows, a securely attached toe board or bumper not less than 6 inches thick and high shall be provided at chute opening to prevent equipment or wheelbarrows falling into the chute.
11. Dust: Provisions for dust control shall include the use of water to keep material or debris sufficiently wet or other equivalent steps taken to prevent dust from rising.
  12. If you have any questions or are unclear about the safety of work on your job, stop and ask your superintendent. Work safely in demolition to prevent injuries.

## **DRIVING SAFETY**

1. Employees may use cellular telephones or mobile electronic devices while operating a motor vehicle **ONLY** if a hands-free device is used.
2. Only authorized drivers may operate a company vehicle.
3. Never operate a vehicle under the influence of alcoholic beverages, medications, or other controlled substances or drugs.
4. Obey all traffic laws.
5. Observe legally permitted speed and adjust speed accordingly for road conditions, heavy traffic, and/or adverse weather.
6. Practice defensive driving techniques.
  - Observe safe following distance rules.
  - Switch on headlights when driving during low light conditions, including inclement weather.
  - Anticipate what other drivers on the road might do wrong and plan a mode of escape.
  - Do not move through traffic aggressively.
  - Do not drive while fatigued. Take regular rest stops during long trips, every four hours. Never drive more than 10 hours during a 24-hour period. When possible, avoid driving after midnight.
7. Wear seat belts and shoulder harnesses (including passengers).
8. Avoid abuse, theft, neglect, or disrespect of the vehicle. Doors shall be locked while driving and whenever the vehicle is unoccupied.
9. Do not exceed the maximum number of passengers intended for the vehicle.
10. Do not transport firearms in a company vehicle.
11. Do not pick up hitchhikers or strangers.
12. Apply the parking brake when getting out of the vehicle.
13. Do not take notes, read a map, eat, or perform other distracting activities while driving. Pull over and stop in a safe location to accomplish these activities.
14. Report to management all vehicle accidents and/or thefts, accurately, and timely.

15. Report all moving violations within 7 working days of the violation to management.
16. Report any defect that would prevent safe operation.

## **ELECTRICAL SAFETY**

Only a Qualified Person shall work on electrical equipment or systems. A Qualified Person has the knowledge, training and experience to safely work on electrical systems.

All employees shall follow these general electrical safety practices:

1. Electrical tools shall be maintained in good condition with proper electrical grounds and ground connections or approved "Double Insulation" construction.
2. Employees shall inspect electrical cords before using them. Damaged, cut, or worn electrical cords shall be removed from service and repaired or replaced.
3. Electrical cords shall be protected from physical abuse (equipment or vehicle traffic) at all times.
4. Connections of cords and tools shall be protected when working in wet conditions, on wet pavement or locations.
5. All 120-volt, AC, single-phase, 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, shall have approved ground-fault circuit interrupters (GFCI).
6. Temporary power boxes shall be maintained in good condition. All temporary wiring installations shall be grounded.
7. If the power source is damaged or does not operate correctly, the condition shall be reported to the Superintendent.
8. All electrical conductors shall be treated as energized unless confirmed through the Lockout/Tagout program. Employees shall not enter a dark area that may contain energized electrical parts.
9. Sufficient access and working space shall be provided and maintained around electrical equipment. At least 10 feet of clearance shall be maintained between equipment and overhead power lines. This includes extension tools, forklifts, and aerial lifts.

## **EXCAVATIONS AND TRENCHING**

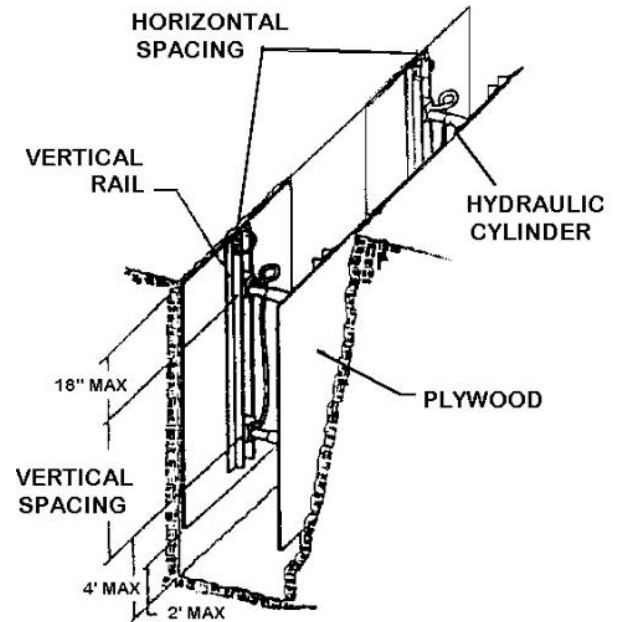
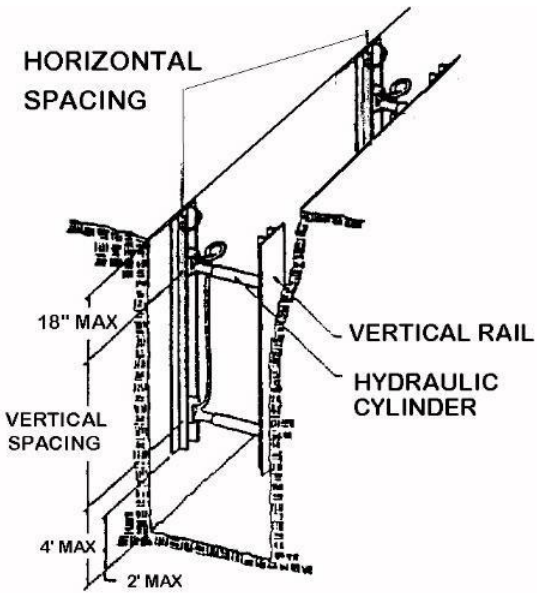
If an employee must enter a trench or excavation, appropriate precautions shall be taken. The following are general safety practices for excavations:

1. Before beginning excavation, all underground utilities and installations shall be identified and marked.
2. Employees who enter excavations 5 feet or greater in depth shall be protected by shoring, sloping or another approved method. The Competent Person shall determine if shoring, sloping or another approved method is needed in an excavation less than 5 feet in depth.
3. Work in excavations shall at all times be under the supervision of a Competent Person who is given the authority to modify the sloping or shoring in accordance with Cal/OSHA standards.

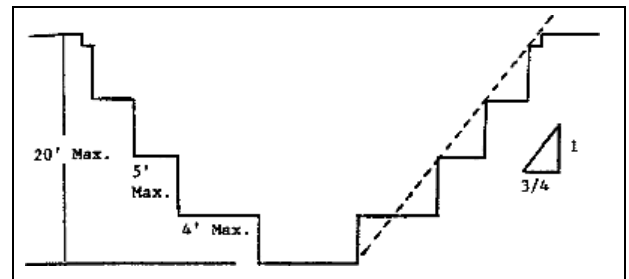
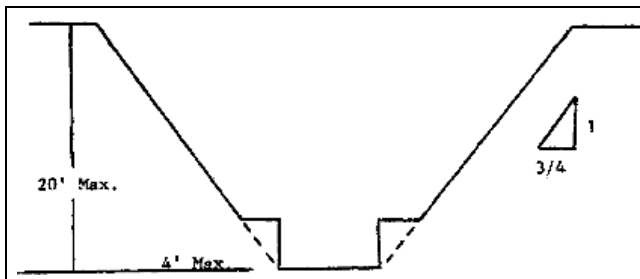
4. Before any employee enters any trench, the Competent Person on the job shall make a daily inspection of the trench walls, banks, and top.
5. Excavation spoils shall be located at least 2 feet from the edge of the trench.
6. Lagging of Cutter Soil Mix (CSM) wall surcharge capacity must be known.
7. Trenches that are greater than 4 feet in depth shall have a ladder or similar means of escape within 25 feet of where employees may work.
8. After a rainstorm, earthquake, or other hazard increasing event, all trench faces, walls and top banks shall be inspected by the Competent Person and identified hazards corrected.
9. Overhanging banks shall be avoided by moving spoil farther away from the edge of the trench.
10. Barricade or warning signs (e.g., caution tape) shall be used to alert people to the hazard of an open trench.
11. Means (i.e., barriers) shall be provided to prevent mobile equipment from inadvertently entering the excavation.
12. Employees shall only cross a trench if there is a 20-inch wide walkway.
13. Where the trench depth is 6 feet or greater, railings shall be installed, or employees shall use personal fall protection.

## Excavations and Trenching – Illustrations

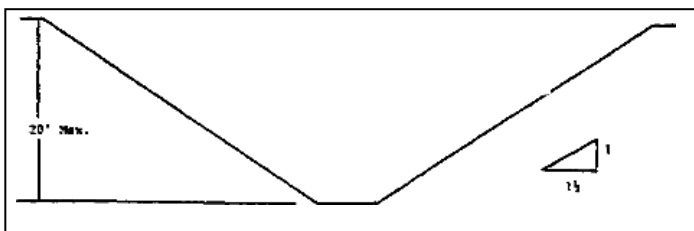
### Shoring



### Benching Type B Soil



### Sloping Type C Soil



## FALL PREVENTION

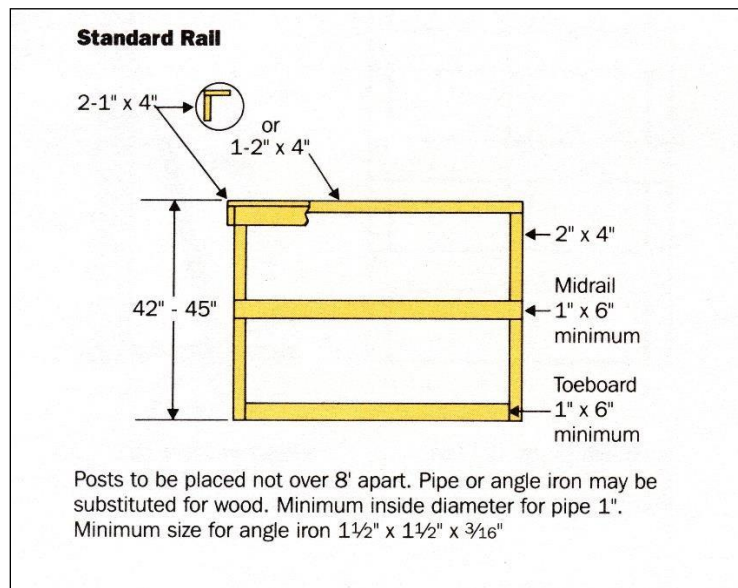
Employees exposed to fall hazards shall be trained by a Qualified Person to recognize the hazards of falling and procedures to follow to minimize these hazards. Re-training shall be provided when there are deficiencies in training, changes in the workplace, or changes in the fall protection system or equipment.

1. Housekeeping is important to fall prevention. Debris shall not be discarded in places that could pose trip/fall hazards to others. Scrap shall not be thrown on walkways, stairways, balconies or scaffolding.
2. Walkways shall not be blocked with tools, tarps, or other material.
3. Holes in floors, walkways and work surfaces shall be protected by guardrails OR covered with labeled cover ("Opening – Do Not Remove") made of solid wood or metal secured in place. Covers shall hold 400 pounds or twice the expected load.

## Railings

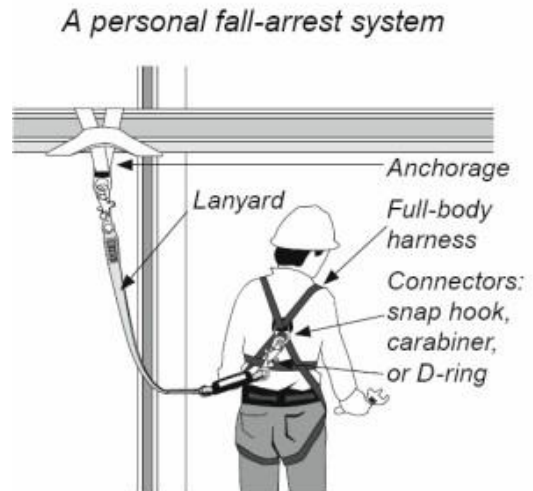
1. Standard guardrails shall be installed on all work platforms 6 feet or more in height. A standard guardrail is 42 inches to 45 inches high and is constructed with 2-inch by 4-inch rails.
2. Guardrail posts shall be 8 feet or less apart.
3. A mid-rail shall be installed halfway between the top rail and the work platform (usually 21 inches).
4. Guardrails shall be able to withstand a force of 200 pounds (13 pounds per linear foot) at any point on the rail.
5. Toe boards are required (1-inch x 4 inches nominal), if people are working or passing below.

### Standard Rail Illustration



## Personal Fall Protection

1. Approved personal fall protection systems (ANSI compliant) shall be used when working at or over 6 feet high.
2. Set an anchorage point (5,000-lb. capacity) to provide a secure point of attachment for lifelines, lanyards, or deceleration devices.
3. A body harness shall be secured around the employee to spread out forces from fall arrest and connect to the deceleration device. A deceleration device limits the force on the body energy during a fall arrest. Use a rip stitch or tearing lanyard or a self-retracting lifelines/lanyards (Yo-Yo).
4. Fall protection equipment shall be inspected before use. Damaged or broken fall protection equipment shall not be used.
5. The Superintendent shall provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves.



## FIRE EXTINGUISHERS

1. Safe and unobstructed access to fire extinguishers shall be maintained. Locations of fire extinguishers shall allow for easy access and for clear viewing.
2. The maximum travel distance from any point to the nearest fire extinguishers shall not exceed 50 feet.
3. Signs shall be used to show fire extinguisher locations.
4. Fire extinguishers shall be rated type ABC, a dry chemical extinguisher.
5. Fire extinguishers shall be inspected monthly and noted on the tag. The extinguisher shall be serviced at least annually by an authorized service company.
6. Inspection of extinguishers shall confirm:
  - Each fire extinguisher is at its designated location
  - Access is not obstructed
  - There are no signs of use (broken seal, gauge low)
  - The pressure gauge reads fully charged (pointing to the green section on the dial); any 'discharged' fire extinguisher shall be replaced with a fully charged unit
7. Annual training shall be required to use a fire extinguisher.



**P.A.S.S**

Pull  
Aim  
Squeeze  
Sweep



**FIRE PREVENTION**

These practices help prevent fires:

1. No plastic gas cans shall be allowed onsite. Only UL Approved safety cans shall be used for dispensing flammable liquids. An approved safety can is metal, has a self-closing lid, and bonds to prevent a static electricity discharge.
2. Flammable liquids shall be kept in closed containers when not in use.
3. When filling portable gasoline containers, containers shall not be in the vehicle or truck bed. Place containers on the ground to prevent static electricity from igniting gasoline vapors.
4. Spills of flammable or combustible liquids shall be cleaned up promptly. Refer to the Safety Data Sheet (SDS) or Material Safety Data Sheet (MSDS) for the spilled liquid for guidance.
5. A fire extinguisher shall be immediately near all hot work (cutting, brazing, soldering). A minimum 30-minute fire watch shall be posted after hot work is completed.
6. Walkways exit paths and stairways in buildings shall be kept clear.
7. Oil-soaked rags shall be kept in a closed metal container.



## **FORKLIFTS (POWERED INDUSTRIAL TRUCKS)**

Silverado Contractors, Inc. maintains a Powered Industrial Truck Program. These safety practices for PIT operation shall be followed:

1. Employees shall not operate powered industrial trucks (PITs) unless they have been certified and trained on the types of equipment to be operated. Recertification of operator performance shall be completed every 3 years. Certification shall include the operator's name, training date, evaluation date and trainer/evaluator name.
2. Refresher training shall be required if an operator is observed driving unsafely, is in an accident, or if the type of PIT changes.
3. The operator shall complete a checklist at the beginning of the work shift. All unsafe conditions shall be reported to the Superintendent.
4. PITs on construction sites shall have working backup alarms (horns or bells) to alert others of equipment movement.
5. PITs shall not exceed the authorized speed limit.
6. Employees shall not ride on the PIT unless the PIT is designed to be used for passengers.
7. Seat belts shall be worn while operating the PIT.
8. Stunt driving, and horseplay shall not be tolerated at any time and employees may be terminated for this activity.
9. When leaving the PIT unattended, the forks shall be lowered flat to the ground, the brake set, and the PIT turned off.
10. Operators shall look in the direction of travel and not move the PIT unless it is safe to do so.
11. When carrying loads, the load shall be carried as low as possible. When descending or ascending grades, travel with the load upgrade.
12. No part of the body shall be placed outside the running lines of the PIT.
13. Employees shall not walk under or allow others to walk under elevated forks whether loaded or empty.
14. Ground conditions shall be checked when operating PITs, especially after rain.
15. If there is not clear, easy access at the jobsite, operation shall be stopped, and the condition reported to the Superintendent.
16. PITs shall not be loaded beyond the rated capacity which shall be visibly posted in clear view of the operator.
17. The load shall be checked and confirmed it is secure before making the lift. If unsure that the load is secure, check the operation again before making the lift.



## GRINDERS

Hand held grinders come equipped with guards. The guard prevents a cut or other injury caused by contact with the rotating disk.

1. The guard shall be kept in place.
2. Employees shall wear eye protection (safety glasses) to prevent metal particles from being sent into the operator's eyes.
3. The disk shall be checked to confirm it is the correct disk for the grinder. Disks can shatter or explode, sending pieces flying in all directions.
4. Electrical cords shall be kept in good condition.
5. The grinder shall be taken out of service if there is a defect.



## HAND TOOLS

Using hand tools is a part of every project. Employees shall follow these safe practices when using hand tools:

1. Employees shall check hand tools to make sure that the tools are safe and well maintained.
2. Damaged or worn hand tools shall be replaced.
3. The tool handle shall be secured tightly to the tool head. Fractured or broken handles shall be replaced.
4. Tool cutting edges shall be kept sharp and true so that the tool moves smoothly with no binding or slipping.
5. Tools shall not be thrown around the jobsite. It could cause damage to the tool and may injure other employees.
6. Chains, jacks, slings, come-alongs and related equipment shall be inspected before use and replaced if damaged or worn.
7. Tools shall be stored in neat dry areas to prevent damage or excessive wear.
8. Employees shall be responsible for using the right tool for the job. (Do not use screwdrivers as pry bars and pliers as hammers). Also, employees shall ensure the tool is the right size for the job to be done.
9. Hands shall be kept out of impact areas. Hands shall not be placed under a hammer or any other impact tool.

## **HAZARDOUS MATERIALS**

Protect your health: Follow all training, warning signs, and personal protective equipment requirements. If you have any concerns about hazardous materials, stop and ask your superintendent for help.

### **Safety Data Sheets (SDS)**

Silverado Contractors, Inc. keeps Safety Data Sheets on hazardous materials and chemicals used at our workplaces, through the Hazard Communication Program. If you want to see or copy an SDS, ask your superintendent or the RSO.

## **Asbestos**

### **Hazard**

Breathing in asbestos fibers can make you sick. The most dangerous asbestos fibers are the ones you cannot see. When these fibers get into your lungs or digestive tract, they can lead to serious diseases including Asbestosis, a scarring of the lungs that makes it difficult to breathe; Lung cancer; or Mesothelioma, a rare cancer in the chest or stomach. These diseases can take years to show up.

### **Control**

Silverado Contractors, Inc. has a detailed asbestos hazard control program, including sampling and abatement. Look for and follow warning signs. Never smoke, eat, or drink in areas marked with an asbestos warning sign. If you smoke, quit. Both asbestos and smoking can cause lung cancer. If working in asbestos area, follow all training and personal protective equipment requirement.

## **Lead**

### **Hazard**

Lead can damage kidneys, brain, nervous system, and cause blood problems. Children can suffer greatly from lead.

Lead enters the body through inhalation or ingestion (eating) of lead-containing materials. Eating, drinking, or smoking with hands or faces contaminated with lead-containing materials is the usual way that ingestion occurs.

### **Control**

Silverado Contractors, Inc. has a comprehensive lead program to protect health. This includes sampling of materials and air, blood lead tests, and abatement. If your job involves lead, follow all safety measures including personal protective equipment and clothes changing. Wash your face and hands before you smoke, eat or drink.

## **Silica**

### **Hazard**

Crystalline silica is in the earth's crust. Quartz, the most common form of silica, is part of sand, stone, rock, concrete, brick, block, and mortar. During tasks that disturb these materials (cutting, grinding, breaking, and jackhammering), silica containing dust can be released into the air.

Silica dust is hazardous when very small (respirable) particles are inhaled. Very small dust particles can go deep into the lungs and cause lung diseases, including silicosis and lung cancer, as well as kidney disease.

### **Control**

Silverado Contractors, Inc. has a detailed Silica Exposure Control Program to prevent unsafe exposure to silica.

Use water and/or vacuums to reduce dust before it becomes airborne. When water and vacuums are not enough, use respiratory protection. Keep dust control systems in good working order. Check vacuum filters and hoses regularly to make sure they are not clogged.

Avoid eating, drinking, and smoking where there is silica dust. First leave the dusty area and wash your hands and face. Avoid bringing dust home. Remove dust from your clothes or change into clean clothing before leaving the work site. Do not blow dust off because it can get into the air.

## **HEAT ILLNESS PREVENTION**

Silverado Contractors, Inc. employees shall receive Heat Illness Prevention training following the Heat Illness Prevention Plan.

Heat illness occurs when the body keeps in more heat than it loses, and the body's temperature rises. Heat illness can be one or more serious medical conditions like heat cramps, fainting, heat exhaustion and heatstroke.

You are at greater risk of heat illness if you:

- Are dehydrated
- Are not used to working in the heat
- Are in poor health
- Have had heat illness before

Prevent heat illness by doing the following:

1. Building up tolerance to work in the heat – it takes about two weeks to acclimate.
2. Knowing the shade location and getting out of the sun or finding a cool resting place when you are starting to overheat and need to cool down.
3. Avoiding alcohol or caffeine – these make the body lose water and increase the risk of heat illness.
4. Drinking cool, fresh water throughout the day; drink 4 cups (8 oz. each) per hour during hot weather because that is how much water the body loses by sweating.
5. Not waiting until you are thirsty to drink.

Heat exhaustion is a heat illness caused by dehydration and/or lack of acclimatization.

Symptoms include:

- Heavy sweating
- Fatigue
- Weakness
- Headache
- Dizziness/confusion
- Nausea/vomiting
- Intense thirst
- Skin is cold, pale, and clammy
- Fast shallow breathing

If a person has heat exhaustion, do the following:

1. Move the victim to a cool shaded area to rest; do not leave the victim alone
2. Loosen and remove any heavy clothing
3. Have the victim drink cool water (about a cup every 15 minutes) unless sick to the stomach
4. Cool the victim's body by fanning and spraying with a cool mist of water or with wet cloths
5. Call 911 for help if the person does not improve

Heat stroke is a severe medical emergency.

Symptoms include:

- Dry pale skin with no sweating
- Hot red skin that looks sunburned
- Confusion or inability to think straight
- Seizures or fits
- Unconsciousness

If a person has heat stroke, do the following:

1. Call 9-1-1 immediately. Delay can be fatal
2. **Move the person to a cool shaded area.**
3. **Do not give the person fluids.**
4. **Reduce body temperature with cool baths, sponges or soaking clothes with water.**

Temperature triggers:

1. Shade up – 80 °F
2. High heat procedures – 95 °F

## Two types of heat illness:

### Heat Exhaustion



Dizziness



Headache



Sweaty skin



Fast heart beat



Nausea, vomiting



Weakness



Cramps



### Heat Stroke



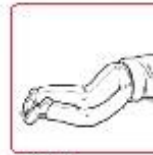
Red, hot, dry skin



High temperature



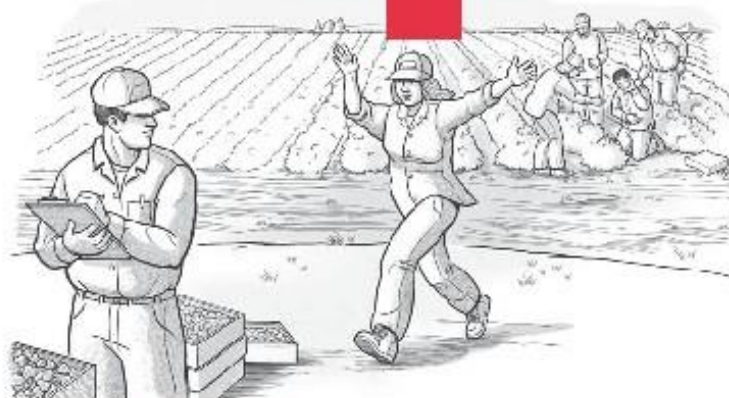
Confusion



Fainting



Convulsions



***Heat kills – get help right away!***

## Stay safe and healthy!

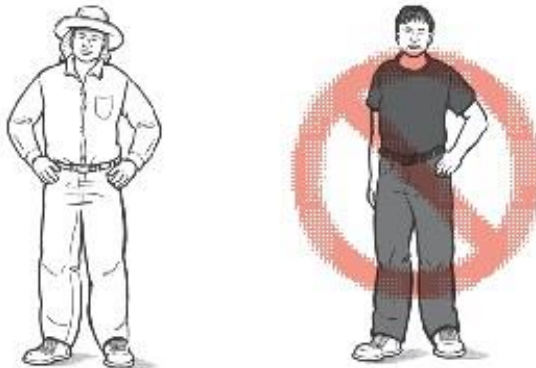
**Drink water even if you aren't thirsty –  
every 15 minutes**



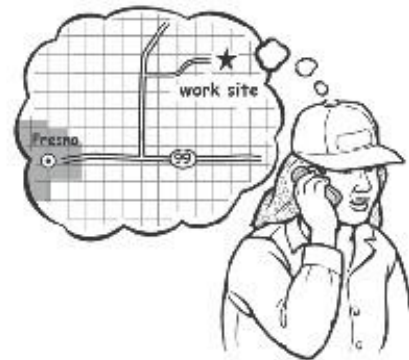
**Watch out for each other**



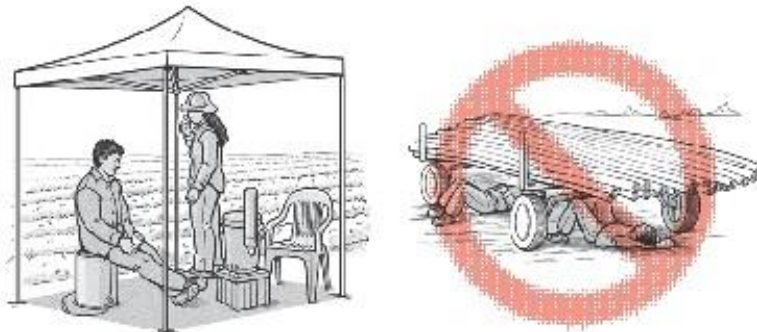
**Wear a hat and light-colored clothing**



**Know where you are working  
in case you need to call 911**



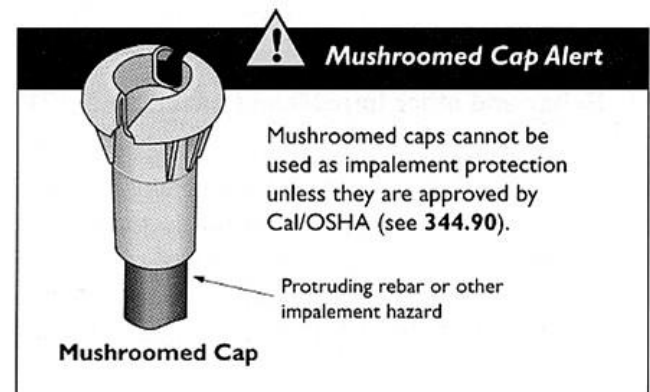
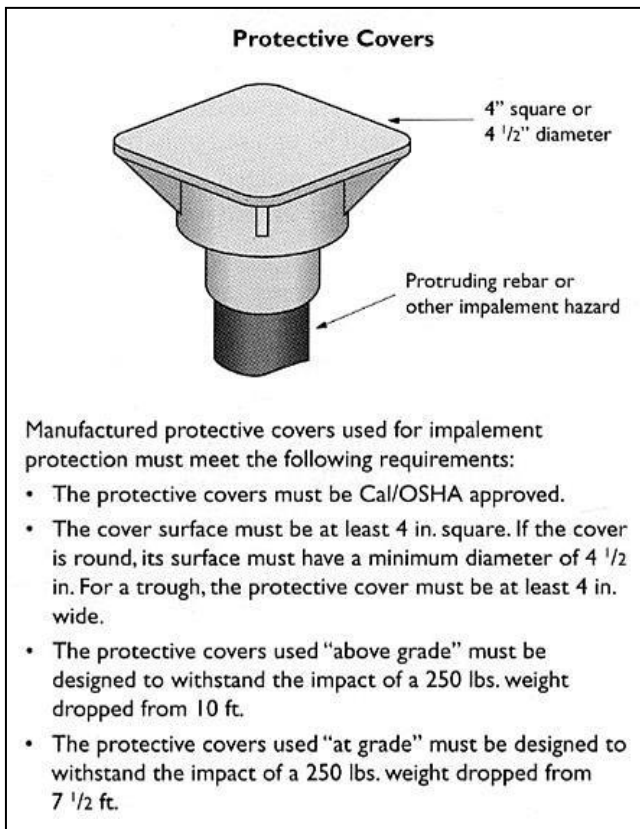
**Rest in the shade**



## HOUSEKEEPING

Housekeeping on the jobsite and employee safety are closely linked. These safety practices shall apply to all locations:

1. Spilled liquids shall be cleaned up immediately.
2. Scrap piles shall be designated at all jobsites. Scrap materials shall be placed in the designated pile.
3. Material storage areas shall be free of holes, obstructions, and debris.
4. Access areas (walkways, stairways, ladders, ramps) shall be reasonably clean and free of stored materials. Employees shall be responsible for keeping work access areas clean.
5. Electrical cords, air hoses, tools, and equipment shall be placed so that no trip and fall hazards are created.
6. Employees working in elevated work areas (raised floors, mezzanines) shall make sure that tools or material do not fall striking employees below.
7. Employees shall be aware of areas with poor lighting and shall report such conditions to the Superintendent.
8. All protruding reinforcing steel (rebar) or similar projections posing an impalement hazard shall be bent over or protected with approved protective covers.





9. SWPP (Storm Water Pollution Prevention) regulations for the jobsite shall be followed. For example, cover materials in the winter or during rain, use secondary containment as needed and maintain all runoff waddles.
10. Employees shall notify the Superintendent of housekeeping hazards or the need for housekeeping improvements.
11. Employees who discard scrap or do other acts to increase hazards shall be disciplined up to and including termination.

## **INSECTS AND SNAKES**

Employees shall follow these safety practices to avoid contact with insects and snakes:

1. Avoid sitting on rotten logs or stumps. Spiders and ants often use them for homes.
2. Wear long-sleeved shirts, socks, and long pants to guard against stinging insects.
3. Use caution when moving debris.
4. Look before reaching into a space.
5. Do not put your hands or feet into areas you cannot see, such as brush piles or rock crevices.

### **Ant Bites and Stings**

1. Stay away from fire ants. Their bites are painful and can result in blisters.
2. If an employee is bitten and experiences serious swelling, slurred speech, chest pains, sweating, nausea, or loss of breath get medical help immediately.

### **Bee Stings**

1. If stung by a bee, remove the stinger gently (with tweezers, if possible).
2. Apply an ice pack or a cloth dipped in cold water to reduce swelling and itching.
3. If an employee has an allergic reaction to a sting or bite, get medical help immediately.

### **Spider Bites**

Most spider bites cause only minor injury. A few spiders can be dangerous, including the black widow spider and the brown recluse spider.

Seek emergency care immediately if:

1. An employee is bitten by a black widow or brown recluse spider.
2. An employee is unsure whether the bite was from a poisonous spider.
3. An employee is having severe pain, having abdominal cramping, or there is a growing ulcer at the bite site.
4. An employee who was bitten is not breathing.

Spider bite care:

1. Clean the wound. Use mild soap and water and apply an antibiotic ointment.



2. Apply a cool compress. Use a cloth dampened with cold water or filled with ice. This helps reduce pain and swelling.
3. If the bite is on an arm or leg, elevate it.

## Snakes

Employee shall follow these safety practices:

1. Wear sturdy gloves and boots at least 10 inches high when working in snake country
2. Use caution when moving debris.
3. If a snake is seen, step back and allow it to move along or go around it.
4. Be aware that a snake's striking distance is about half its length

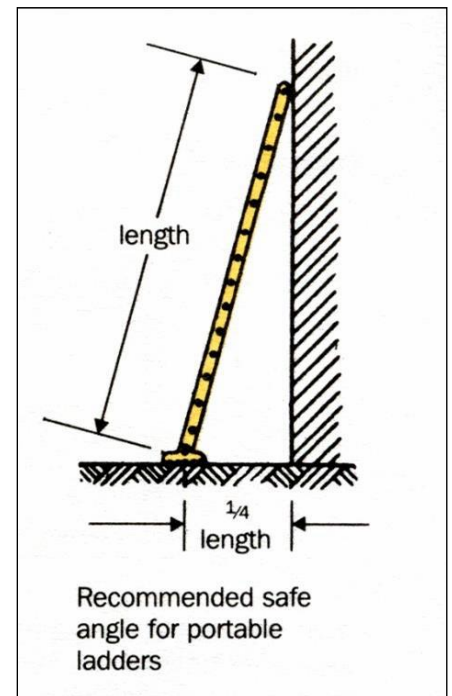
Snake bite care:

1. Get medical attention for all snake bites, whether venomous or not
2. If breathing difficulties, difficulties in swallowing, and/or body-wide itching develop, the individual is having a severe allergic reaction. Call 911 immediately for assistance.
3. Rinse, apply first aid: wash the bite or sting area well with soap and water to help prevent infection.

## LADDERS

Ladders shall be maintained in good condition at all times. These safe work procedures shall apply to ladder use at all sites:

1. Employees shall select the correct ladder for the job. Employees shall not overload the weight capacity of the ladder or use a ladder that is too short.
2. Only non-conductive ladders (fiberglass or wood) shall be used where there is exposure to energized electrical systems.
3. Before use, a ladder shall be inspected to ensure that rungs, fittings, braces, rails and cleats are in good condition.
4. If the ladder is unsafe, the ladder shall not be used, and the condition of the ladder shall be reported to the Superintendent. All broken or defective ladders shall be taken out of service or removed from the job.
5. When setting a straight ladder, the feet of the ladder shall be placed 1 foot from the base of the vertical for every 4 feet of ladder length (see illustration).
6. When climbing to another level on a straight ladder, the top of the ladder shall extend at least 3 feet beyond the platform.
7. Access ladders shall be tied off to prevent falling or slipping.
8. Employees shall not work higher than the third rung from the top on a straight ladder.



9. Employees shall get help when raising a long ladder. One employee shall brace the bottom end while the other employee lifts the top end.
10. Ladders shall be kept free from dirt, mud, and oil.
11. Ladders shall have safety feet to prevent them from slipping. If the safety feet will not keep the ladder secured, the base shall be tied off to prevent slipping.
12. Ladders shall be used only for their intended purpose. Ladders shall not be used as a workbench or scaffold component.
13. On an A-frame step ladder, employees shall not work from the top cap and step of a stepladder.
14. A-Frame step ladders shall be used in the open position. The A-frame ladder shall not be leaned against something and then climbed on in the unopen position. Employees shall climb only on the steps, not the cross bracing.
15. When using a ladder, employees shall face the ladder and use both hands while climbing and descending. Tools and equipment shall be hoisted up or handed to the employee. Always keep 3-points of contact with the ladder.
16. Ladders shall not be placed in doorways, driveways, or where they may be displaced by other work. If there is no other place to set up, barricade the area.
17. When working on a ladder, employees shall keep their bodies inside the side rails of the ladder to prevent tipping.

## **LOCKOUT/TAGOUT**

Silverado Contractors, Inc. has a Control of Hazardous Energy or Lockout/Tagout Program which establishes requirements for lockout of energy sources that could injure people. Lockout keeps equipment from being activated or electricity from being turned on while someone is working on the circuit. All employees shall comply with the Lockout/Tagout Program.

### **Disconnect**

The easiest form of lockout is to unplug a machine from electricity or compressed air (pneumatic energy). If an energy source cannot be unplugged, then this procedure shall be followed:



### **Preparation for Lockout**

1. Employees authorized to lockout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources shall be cleared with the Superintendent.
2. The three most common energy sources are electrical, pneumatic (compressed air) and hydraulic.
3. All authorized employees shall have their own lock, key, and a supply of tags.

4. All authorized employees shall receive training on how to lock out energy sources in their work.

### **Sequence of Lockout Procedure**

1. Before lockout starts, job authorization shall be obtained from the Superintendent.
2. All affected employees shall be notified that a lockout is required and why.
3. Authorized employees shall trace all energy sources (electrical, hydraulic, pneumatic, and mechanical) to identify the shutdown and lockout point.
4. If the equipment is operating, the equipment shall be shut down by the normal stopping procedure (depress stop button, open toggle switch).
5. The switch shall be operated so that the energy source(s) (electrical, mechanical, hydraulic, or other) is disconnected or isolated from the equipment. Stored energy, such as in capacitors, springs, hydraulic systems, and air, gas, steam, or water pressure, shall also be dissipated or restrained by methods such as grounding, repositioning, blocking, and bleeding down.
6. Each authorized employee working on a system shall place their own lock in the lockout device.
7. The authorized employee shall place the key in his/her pocket.
8. A "Do Not Operate" tag shall be placed on the lockout. The tag shall include the name of the employee placing the lock, the work performed, and the date/time.
9. The authorized employee shall ensure that no people are exposed and check to make sure the energy sources are locked out.
10. The push button or other normal operating controls shall be operated to make certain the equipment will not operate. CAUTION: Return operating controls to neutral position after the test.
11. The equipment is now locked out and work can now safely proceed.

### **Restoring Equipment to Service**

1. When the job is complete, and the equipment is ready for testing or normal service, the equipment area shall be checked to see that no one is exposed.
2. The guards or other safety devices shall be reinstalled.
3. All locks and tags shall be removed. Each employee shall remove his or her own lock and tag.
4. The energy isolating devices (power switch) may be operated to restore energy to equipment.

## MATERIAL HANDLING

Materials used on jobsites and in shops shall be stored and handled to minimize hazards to employees.

These safety practices shall be followed to minimize hazards from material handling:

1. When lifting or handling long lengths, employees shall get help if necessary to prevent injury.
2. Employees shall get help moving heavy loads.
3. Before lifting, employees shall know where the load will be put down.
4. **If work is below the waist level, employees shall squat down. DO NOT stoop over.**
5. Mechanical aids such as hoists, lift trucks, and rolling carts shall be used to eliminate or decrease lifting.
6. Employees shall try to reduce twisting and bending motions by locating objects in an easy arm-reach. Allow space for the entire body to turn and pivot with the feet.
7. Storage sites for materials shall be designated by the Superintendent. Storage areas shall be reasonably level and free of irregularities (pits, holes, trenches, etc.), with easy access provided for the movement of material by forklifts or employees.
8. When lifting, bend your knees, keep the load close and avoid twisting the back.

Remember:

- B Get your **BALANCE** in the lifting position
- A **ALIGN** your back – as straight as possible
- C Get **CLOSE** to the item you are lifting
- K Bend your **KNEES** and lift with your legs

If you need help, **ASK!**



## MOBILE EQUIPMENT

No employee shall operate equipment (e.g., excavators, backhoes, loaders) unless properly trained and authorized.

Employees shall follow these safety practices when working around mobile equipment:



1. Employees shall stay alert and aware of their surroundings at all times.
2. Employees shall position themselves away from the path of mobile equipment operations.
3. Do not depend on hearing a horn or other audible warning signal to know that equipment is backing up.
4. Do not walk under loads or stand under overhead operations.
5. Employees shall warn others of moving or approaching overhead loads.
6. Employees shall not take for granted that the operator sees them and shall stay out of the operator's blind spot. If an employee cannot see the operator, the operator cannot see the employee.
7. Employees shall stay out of the swing radius of the equipment, so they are not hit. Do not cross barricades.
8. Do not attempt to distract signal persons/spotters or crane operators while they are performing their jobs.
9. Employees shall not walk under loads or stand under overhead operations.
10. Employees shall warn others of moving or approaching overhead loads.
11. Contact with overhead power lines can cause serious injuries and property damage due to arcing between the lines and heavy equipment. Equipment shall be kept at least 10 feet away from overhead power lines.
12. Warning signs shall be obeyed.
13. Equipment shall only be worked on by authorized employees who are properly trained on applicable Lockout/Blockout procedures.

## **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

While performing work duties, employees shall wear PPE such as head, eye and hearing protection where required.



All PPE shall meet the applicable American National Standards Institute (ANSI) standards.

These general safety practices for PPE shall be followed:

1. Defective or damaged PPE shall not be used.
2. As a minimum, employees shall wear safety boots with impact protection, when exposed to crushing hazards to the feet.
3. Eye protection shall be provided and shall be worn when work operations pose eye injury hazards. This includes safety goggles and face shields.
4. Head protection (hard hats) shall be provided and shall be used by all employees who are exposed to falling objects and/or bump hazards.
5. Hand protection (gloves) shall be provided to employees who are exposed to harmful physical and chemical hazards that may cause injury. When there is a danger of hand protection being caught in moving machinery, gloves shall not to be worn.
6. Employees shall wear coveralls provided by Silverado Contractors, Inc. Employees shall wear long pants and shirts with sleeves (no sleeveless shirts).
7. Employees shall wear body protection (hi-vis vest) as required.
8. Employees shall wear Tyvek suits as required.
9. Hearing protection shall be available at jobsites. Employees shall wear hearing protection when there are loud noise exposures for extended periods of time.
10. When working outdoors and exposed to the sun, it is recommended that employees wear sunscreen to protect against sunburn.
11. Respirator use is covered by our Respiratory Protection Program. Employees who voluntarily use respirators shall read and follow Appendix D:

## **RESPIRATORS – VOLUNTARY USE**

Appendix D (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged even when exposures are

below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

## **PNEUMATIC TOOLS AND AIR COMPRESSORS**

These safety practices apply to using air compressors and pneumatic tools:

1. Air compressors shall be equipped with operable pressure relief valves and pressure gauges.
2. Pressure shall be bled off compressor tanks before being inspected or repaired.
3. Portable compressors shall be blocked, locked or otherwise kept from rolling.
4. Covers shall be kept in place to guard fans or power transmissions mechanisms.
5. Air couplings shall be wired or secured to keep from detaching. Use hose whip checks to control the pressurized air hose in case of coupling failure.
6. Operate gas or diesel air compressors outside of buildings to avoid carbon monoxide poisoning.
7. Employees shall not carry the tool by the hose.
8. Air-operated tools shall be inspected before use. If the tool is defective, it shall be taken out of service and tagged.
9. Employees shall not hold down the trigger unless firing the tool, especially when walking or climbing a ladder.
10. The job shall be designed so that people are out of the line of fire.
11. The employee's free hand shall be kept out of the line of fire.

12. The tool shall not be rested against any part of the body.
13. Employees shall wear eye protection (safety glasses) when using a pneumatic tool.
14. Hoses shall be placed where they will not cause a danger of tripping. Hoses shall be kept out of the way of equipment.
15. Hoses shall not rub against rough or sharp objects.
16. Employees shall shut off the air supply valve before performing maintenance or changing any bit or accessory. Employees shall not crimp the hose to stop air flow.

## **POWDER-ACTUATED TOOLS**

Only trained and certified employees with a valid operator's card in his/her possession shall operate powder actuated tools. The following practices shall apply to powder-actuated tools:

1. Powder-actuated tools shall be stored in a locked container when not being used.
2. PPE (eye protection and hearing protection) shall be worn when using powder-actuated tools.
3. Powder-actuated tools shall be unloaded and properly secured when not in use.
4. If there is a misfire, the powder-actuated tool shall be held in place for 30 seconds.
5. Powder-actuated tools shall be inspected for obstructions and defects each day before use.
6. A powder-actuated tool shall not be pointed at anyone. Employees shall treat the powder-actuated tool like a loaded gun.
7. Tasks shall be designed so that others will be out of the line of fire.
8. Employees shall not assume the powder-actuated tool is empty.
9. Misfired clips shall be picked up and disposed of according to manufacturer's instructions.
10. Warning signs that say "Powder-Actuated Tools in Use" shall be posted within 50 feet of the powder-actuated tool operation.

## **POWER TOOLS**

Drills, saws, and power tools shall be maintained in safe operating condition. The following safe work practices shall apply to power tools:

1. Power tools shall be equipped with constant pressure switches for ON/OFF control. Power controls shall not be jammed in the "ON" position.
2. Electrical tools shall be inspected before use. If damaged, a tool shall be removed from service and the condition reported to the Superintendent.
3. Defective tools shall be removed from service.
4. Saws shall be in good condition with a sharp blade and grounded electrical cords.
5. Circular saw guards shall be in operable condition and shall not be blocked or tied open.



6. Safety triggers and stop controls on power equipment shall be in good working order.
7. Portable electric tools shall not be lifted or lowered by the power cord.
8. Tools with damaged, cracked or broken casings shall be removed from service if the condition creates a safety hazard to the user.
9. All moving parts (belts, pulleys, cogs, chain drives, etc.) on power tools shall be equipped with guards designed to prevent accidental contact with these parts.
10. Table saws shall be equipped with hood blade guards and anti-kickback device spreaders.

## **SCAFFOLDS**

### **Scaffold Erection and Dismantling**

1. The erection and dismantling of scaffolds shall be performed under the supervision and direction of a Competent Person. A Competent Person has the knowledge, training and experience to safely perform the task.
2. The Competent Person shall tag any unsafe scaffolding. The Superintendent shall ensure that unsafe scaffolding is not used.
3. Scaffolds shall rest on adequate sills and base plates (2-inch x 10-inch x 10-inch lumber or equivalent).
4. Scaffolds shall be tied off with double wrap No. 12 wire, every 26 feet vertically, and every 30 feet horizontally.
5. Standard guardrails 42 inches to 45 inches high, with 1-inch x 4-inch minimum toe board if there are people below, shall be installed on scaffolding when more than 6 feet high.
6. Full planking with a minimum work platform width of 20 inches maintained shall be used.
7. Only scaffold grade lumber shall be used. Check for splits and any other defect that can decrease the structural strength.
8. Each frame or panel shall be braced by horizontal bracing, cross bracing or a combination of the two, to secure vertical members together.

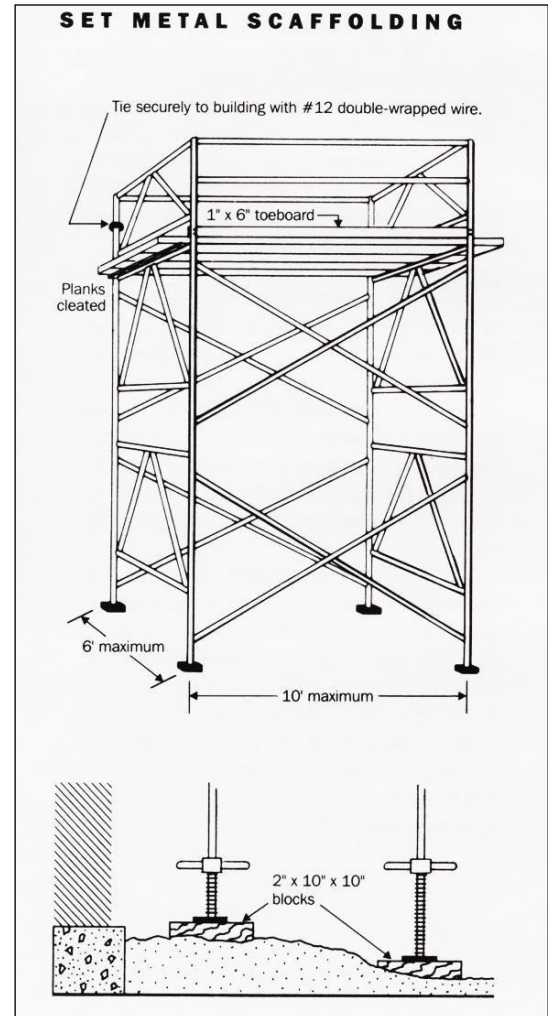
### **Scaffold Use**

1. The Competent Person shall inspect scaffolds daily before use, particularly guardrails, connectors, fastenings, footings, tie-ins, and bracing.
2. Employees shall look at and follow all tags or warnings on scaffolds.
3. Employees shall not use the scaffold bracing to climb up to work platforms. Employees shall use only ladders or attached stairs designed for climbing.

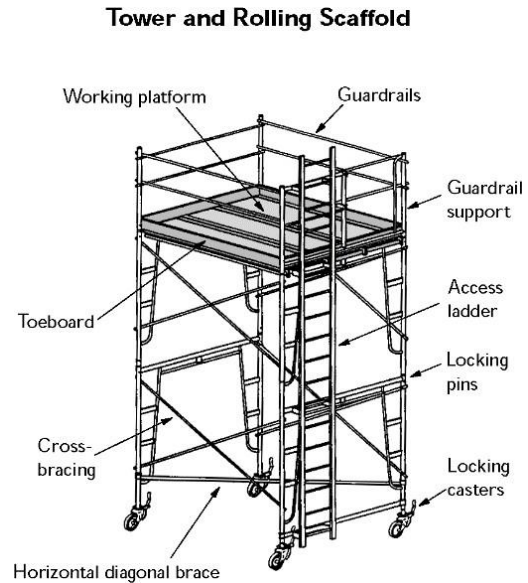
4. Employees shall not jump from one level of a scaffold to another.
5. The platform shall be completely planked. The space between scaffold planks shall not exceed  $\frac{1}{2}$ -inch.
6. Materials shall not be stockpiled on scaffolds; Materials shall be removed at the end of the day.
7. Scaffolds shall not be overloaded. Pile materials being worked over ledger and bearer points to minimize platform loading.
8. Employees shall not work on scaffolds during storms or high winds.
9. Employees shall not bump or strike against scaffolds with vehicles or materials.
10. Platforms and the area around scaffolds shall be kept cleared of debris, unneeded equipment, material, and other hazards.
11. Employees shall not walk on, climb, or work from scaffolding that is structurally unsafe.
12. Employees shall notify the Superintendent or the Competent Person about damaged scaffolding.

### Rolling Scaffold Use

1. Employees shall follow the manufacturer's instructions when using rolling scaffold.
2. Casters with plain stems shall be attached to the panel or adjustments screw by pins or other suitable means.
3. No more than 12 inches of the screw jack shall extend between the bottom of the adjusting nut and the top of the caster.
4. Wheels or casters shall be provided with a locking means to prevent caster rotation and scaffold movement. At least two wheels shall swivel; all four must lock. Wheels shall be locked when employees are working on the scaffold.
5. Joints shall be restrained from separation.



6. Horizontal diagonal bracing shall be used near the bottom and at 20-foot intervals measured from the rolling surface.
7. Railings shall be used if the platform is 6 feet or more above grade.
8. The platform height of a rolling scaffold shall not exceed 3 times the smallest base dimension.
9. All materials and equipment shall be secured or removed from the platform before moving.
10. Employees shall not attempt to move a rolling scaffold without sufficient help. Watch out for holes and overhead obstructions. Stabilize against tipping.



## **MOBILE ELEVATING WORK PLATFORMS (SCISSOR LIFTS)**

Mobile Elevating work platforms (scissor lifts) raise and hold a work platform vertically.

These safety practices apply to mobile elevating work platforms:

1. Only employees trained in the safe use of the scissor lift shall operate or work in a scissor lift.
2. An operation and instruction manual shall be available where the platform is in use.
3. Platforms shall have guardrails and toe boards. Employees shall not stand on guardrails or outside the platform. The guard rail system is fall protection.
4. Electrical power and control cords shall not be used unless grounded. Control pads shall be clearly marked with control functions.
5. Scissor lifts shall be kept at least 10 feet away from energized electrical lines.
6. Scissor lifts shall be equipped with an emergency lowering means.
7. Employees shall inspect the lift before using. Employees shall check tire inflation, tire damage, and instruments for warnings.
8. Employees shall inspect the work area for holes and drop offs, trash, extension cords or anything that may be run over. Trash or clutter on the scissor lift work platform shall be removed.
9. Employees shall check the work and/or travel area for any overhead obstructions. Employees shall exercise great care when traveling near sprinkler pipes, going under building structures, or moving through doorways.



10. The safety chain shall be immediately reattached after getting on to the scissor lift.
11. Scissor lifts shall only be used on level surfaces as the equipment was designed to be used. Driving into a hole or over an edge can cause the scissor lift to tip over.
12. The weight limit for the scissor lift shall not be exceeded.
13. Employees shall not travel across the jobsite in an elevated position. This is prohibited and may result in disciplinary action.

## **WELDING**

Employees shall follow the operating procedures for the type of welding or cutting performed.

These safety practices shall apply to welding and areas where welding is taking place:

1. The welding area shall be protected against fire hazards. Never weld near flammable gases or liquids. Keep combustibles (paper, wood, weeds and grass) clear from hot work.
2. A fire extinguisher shall be immediately available when welding.
3. The correct PPE shall be used when welding:
  - Nonflammable gloves with gauntlets
  - Sturdy leather work boots
  - Welding leathers
  - Long sleeve cotton shirt with collar
  - Welding helmet with correct lens shade
4. Employees shall keep sleeves and collars buttoned. Legs of trousers or coveralls shall not be rolled up on the outside. Sparks may lodge in rolled up sleeves, pockets or cuffs.
5. Gas cylinder safety practices shall be followed. All gas cylinders shall be secured to prevent them from tipping over or falling.
6. All cylinders shall be labeled to identify their contents. Mark empty tanks "MT" or similar, close the valves and replace valve caps securely.
7. Employees shall ensure that cylinders are not placed so as to become a part of an electrical circuit.
8. Oil or grease shall not come in contact with oxygen equipment.
9. Flashback check valves shall be installed at the torch to prevent backflow of gases that could explode.

## **Electrical/Arc Welding**

1. The frames of arc welding and cutting machines shall be grounded.
2. Electrodes shall be removed from the holders when not in use. Electrodes and holders not in use shall be protected so they cannot make electrical contact with employees or conducting objects.
3. Electric power to the welder shall be shut off when no one is in attendance.
4. Welders: Do not coil or loop welding electrode cable around the body.

5. Work and electrode lead cables shall be frequently inspected for damage and replaced when needed.
6. Wet machines shall be thoroughly dried and tested before being used.

## **TRAFFIC CONTROLS**

When there is mobile equipment onsite or exposed to traffic, employees shall wear high visibility vests that can be seen by equipment operators or drivers in traffic.

A spotter directs mobile equipment on a jobsite, and not on a public street or highway.

A flagger will direct traffic on a public street or highway. Street vehicle traffic may need to be temporarily stopped or redirected. Flaggers shall be trained in the proper fundamentals of flagging moving traffic before being assigned as flaggers. Documentation of the training shall be maintained and submitted to the office.

Flagger training and instructions shall be based on the California Department of Transportation Flagging Instruction Handbook, jobsite conditions and shall include:

1. Mandatory flagger equipment
2. Layout of the work zone and flagging station
3. Methods to signal traffic to stop, proceed, or slow down
4. Methods of one-way traffic control
5. Trainee demonstration of proper flagging methodology and operations
6. Handling emergency situations and emergency vehicles traveling through the work zone
7. Methods of dealing with hostile drivers
8. Flagging procedures when a single flagger is used (when applicable)

All employees exposed to traffic or working as a flagger shall wear a reflective or high visibility vest or clothing compliant with ANSI/ISEA 107 Performance Class 2 or Performance Class 3 vests.

### **Performance Class 2**

Use in occupational activities where risk levels exceed those in Class 1 (e.g. parking lots), such as:

- Greater visibility is desired during inclement weather conditions
- Complex backgrounds are present
- Employees are performing tasks which divert attention from approaching vehicle traffic
- Vehicle or moving equipment speeds exceeds 25 mph



### Performance Class 3

Performance class 3 is for use in occupational activities where risks exceed those in Class 2, such as:

- Where employees are exposed to traffic exceeding 50 mph
- Nighttime conditions/poor visibility
- Where work places them in imminent danger from approaching traffic.





## **ACKNOWLEDGEMENT**

I have received, read, and I understand this Silverado Contractors, Inc. Code of Safe Practices.

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Employee

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Date



**SILVERADO**  
CONTRACTORS

## **CODE OF SAFE PRACTICES**

### Addendum

This addendum modifies the existing Silverado Contractors (SCI) Code of Safe Practices to address the safe use of Power Tools.

SCI will ensure that hand and power tools are in good working condition and are used for the task at hand for which they were designed. All power tools will be used in accordance with manufacturer's recommendations.



12. The tool shall not be rested against any part of the body.
13. Employees shall wear eye protection (safety glasses) when using a pneumatic tool.
14. Hoses shall be placed where they will not cause a danger of tripping. Hoses shall be kept out of the way of equipment.
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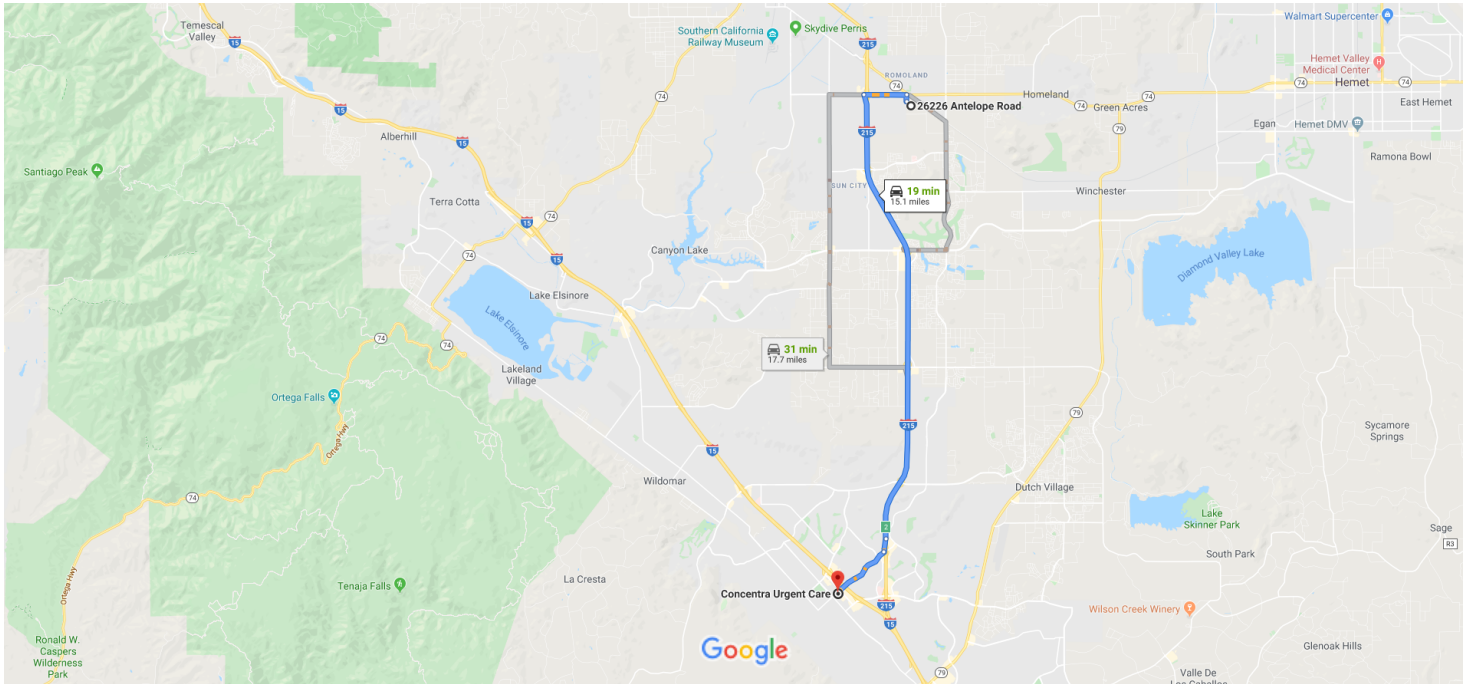
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## 26226 Antelope Rd

Menifee, CA 92585

- ↑ 1. Head north on Antelope Rd toward Jackson Ave  
0.2 mi
- ↩ 2. Turn left onto Ethanac Rd  
1.1 mi
- ⤴ 3. Turn left to merge onto I-215 S  
11.8 mi
- ↘ 4. Take exit 2 for Los Alamos Rd  
0.4 mi
- ↗ 5. Use the right 2 lanes to turn right onto Los Alamos Rd  
1.6 mi
- ⓘ Pass by Jack in the Box (on the left)
- ↩ 6. Turn left  
ⓘ Destination will be on the right  
187 ft

## Concentra Urgent Care

25115 Madison Ave, Murrieta, CA 92562

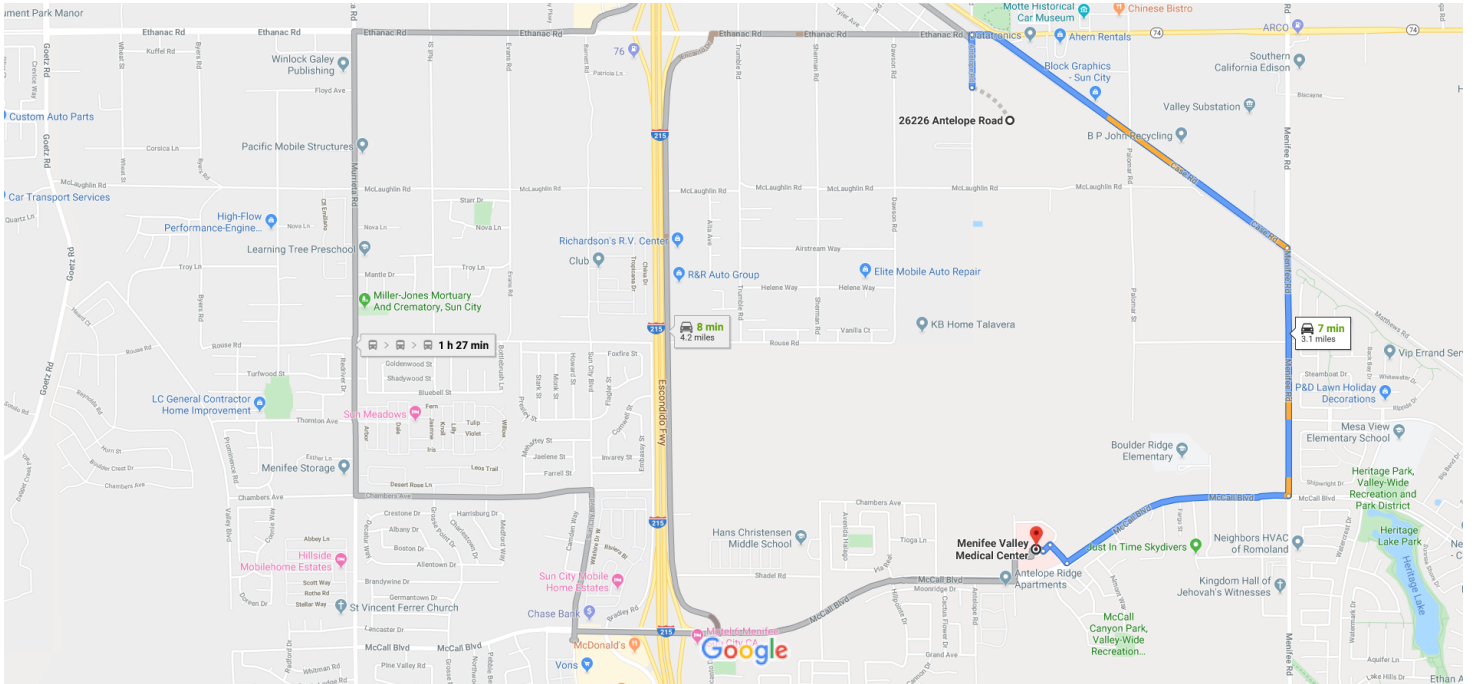
These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

**INLAND EMPIRE ENERGY CENTER**

**NON-MEDICAL EMERGENCIES**  
**CONCENTRA URGENT CARE**

**25115 MADISON AVENUE,  
MURRIETA, CA., 92562**

**PH. (951) 600-9070 / 8:00 AM - 7:00 PM**



## 26226 Antelope Rd

Menifee, CA 92585

- ↑ 1. Head north on Antelope Rd toward Jackson Ave  
0.2 mi
- ➔ 2. Turn right onto Case Rd/Matthews Rd  
1.2 mi
- ➔ 3. Turn right onto Menifee Rd  
0.8 mi
- ➔ 4. Turn right onto McCall Blvd  
0.8 mi
- ➔ 5. Turn right toward Osullivan Rd  
420 ft
- ↶ 6. Turn left onto Osullivan Rd  
157 ft
- ➔ 7. Turn right  
135 ft

## INLAND EMPIRE ENERGY CENTER

## MEDICAL EMERGENCIES MENIFEE VALLEY MEDICAL CENTER

**28400 McCall Blvd., Menifee, CA**  
**Main Phone (951) 679-8888**  
**ER Phone (951) 672-7018 (Open 24/7)**

## Menifee Valley Medical Center

28400 McCall Blvd, Menifee, CA 92585

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



## GPS Projects Minimum EHS Standards

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### Document revision chart

The following chart lists the revisions made to this document tracked by version.

##	Section Modified and Revision Description	Date	Author
1.0	First release of document		
2.0	Alignment to Power – Minimum EHS Standards for Projects	08.08.2018	Various

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### 1. Purpose

The purpose of this document is to define the minimum standard of Environment, Health and Safety to be applied in all activities of GE GPS, in order to mitigate risks to persons, property and the environment.

As a general principle, all work activities undertaken by or on behalf of GE GPS must be covered by task-based EHS Risks and Impacts Analyses, prepared by competent persons and considering all hazards and aspects likely to occur during the execution of the activity. This Directive identifies the main sources of hazards in the activities of GE GPS, and sets minimum requirements for mitigating their associated risks.

### 2. Scope definition

The minimum EHS standards shall be applicable to all stakeholders in all activities performed by or on behalf of GE GPS, whenever GE GPS, its personnel, sub-contractors, customers, property or activities are exposed to the concerned risk or impact.

As such, its requirements must be applied by:

- GE GPS in all of its PROJECTS operations, and;
- Contractors of any tier in all operations they undertake on behalf of GE GPS;

This Directive shall form part of any contract with contractors, concerning the products and services they deliver to GE GPS and shall be agreed by all parties prior to the signing of any binding contract.

This directive describes the minimum requirements to be applied to all locations; however, where any part of this document conflicts with, or sets a lower standard than local applicable EHS regulation, then the local regulation shall apply.

### 3. Abbreviations

Abbreviation	Definition
AED	Automatic External Defibrillator
ATEX Zone	<p>Explosive atmospheres contain a flammable mixture of substances in the form of gases, vapors, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.</p> <p>Mixture of substances can include: Oxygen (O<sub>2</sub>), Hydrogen (H<sub>2</sub>), flammable substances (acetone, methane, gasoline vapors, etc.), metallic particle dust (aluminum, titanium, etc.), organic particle dust (powder coating, coal, sawdust, etc)</p> <p>Sources of ignition can include: naked flame, hot temperature, static and non-static electrical sparks or arc, etc.</p> <p>Flammable / explosive (zone 0, 1, 20 and 21 – European &amp; IEC classification, Class I Division 1 and Class II Division 1 – North American classification).</p>
CMR	Substances that are identified as carcinogenic, mutagenic or toxic for reproduction.
EHS	Environment, Health & Safety
EMF	Electro-magnetic Fields
EN	EN Standards (European Standards)
GFCI	Ground-Fault Circuit Interruptor

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Abbreviation	Definition
GHS	"Globally Harmonized System of labelling of chemicals". System of classification of hazardous substances issued by the United Nations and regulated by Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures.
HV	As defined by country regulation. In the absence of a country regulation that defines High Voltage, GE has adopted the ranges of greater than 1000 Vac and greater than 1500 Vdc to be High Voltage.
HRO	High-Risk Operations - Operational activities presenting high risks due to their nature.
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IR	Infra-red light
LEL	Lower Explosive Limit of the substance (i.e. minimum concentration of the substance in the air, at normal atmospheric conditions, where the substance under the form of gas, vapour, mist or dust can catch fire).
LOTO	Lockout / Tagout - Placement of a locking device and a tag on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the locking device is removed.
LTI	Lost Time Injury - Any work-related injury or illness as a result of which a person is prevented from carrying out work for a period of at least one full day (24h), excluding the day of the injury
LV	Low-voltage, i.e. voltage less than 1000 V AC or DC
MEWP	Mobile Elevated Working Platform
MSDS	Material Safety Datasheet
MV	Medium-voltage, i.e. voltage equal or greater than 1000 V AC or DC and less than 50000 V AC or DC
OEL	Occupational Exposure Limits
OSHA	Occupational Safety & Health Administration from the United States of America
OVHL	Overhead Line
PAC	Preliminary Acceptance Certificate
PCB	Polychlorinated Biphenyls
PoWRA	Point of Work Risk Assessment

### 4. Definitions

In the remainder of the document, terms that receive a capital letter are defined in the following table:

Terms	Definition
Banksman	A competent person, helping drivers of vehicles to maneuver safely, and warning other vehicles and pedestrians of the maneuver.



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Terms	Definition
Competency	A combination of sufficient experience, skills, trainings or qualifications required to safely perform a specific task
Confined Space	<ul style="list-style-type: none"> <li>- Confined space - A space or structure, above or below ground, that is an enclosed or partially enclosed space, large enough that employees can full bodily or partly (head, torso) enter and perform work, with the following characteristics:</li> <li>- limited openings for entry and exit; and</li> <li>- restricted natural ventilation with an atmosphere that may be hazardous; and</li> <li>- a design not made for continuous occupancy.</li> </ul>
Construction vehicles	Any wheel or track-mounted plant used for the execution of the construction or commissioning activities. This includes but not limited to vehicles such as bulldozers, front loaders, backhoes/excavators, dumpers, compactors, cranes (except tower cranes), mobile elevating work platforms, forklifts or telehandlers and any other mobile plant even if not self-propelled (e.g. generators, compressors, lighting towers...)
Contractor	<p>A contractor is a non-GE company who, under a contract, all levels of subcontract or purchase order, is engaged by GE to provide services on GE premises or, under GE management, on a customer or third-party sites (GE_EHS_002).</p> <p>In this document the term 'contractor' will be used for company directly contracted by GE and 'subcontractor' any company contracted further by a GE contractor (including all subcontracting levels).</p> <p>Any contractor (with the exception of hired staff and vendors included in the GE site staff) will be considered as a critical contractor as defined in directive GE_EHS_002 Control of Contractors.</p>
Deviation	<p>Departure from a rule that is known, applicable and understood.</p> <p>Non-compliance with an applicable EHS requirement.</p>
Dry-bulb temperature	The dry-bulb temperature (DBT) is the temperature of air measured by a thermometer freely exposed to the air but shielded from radiation and moisture. DBT is the temperature that is usually thought of as air temperature, and it is the true thermodynamic temperature. A dry bulb temperature does not indicate the amount of moisture in the air.
EHS event	Any unplanned or undesired "occurrence" that causes (or has the potential to – near-miss) death, injury/illness, property damage, impact on the environment or impact on the GE image/reputation.
EHS requirement	Requirement relating to EHS or the management of EHS set out in the legislation, codes of practices, GE site EHS Plan, client specifications and any other applicable EHS document
Electrical Works	Any work on or near energized conductors or equipment where the employee is exposed to the energized conductors or circuit parts, where there are no panels or barriers between conductors and the employee or where some or all of the normal arc containment system has been removed. Near is defined as being outside the limited approach boundary if there is the potential to drop tools or parts onto the energized component.



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Terms	Definition
Excavation	Any non-permanent man-made cut, cavity, trench or depression in the soil surface that is formed by soil removal and at least 50 cm deep. This excludes any permanent designed depressions such as concrete lined pit, unlined lagoons or unlined storm water drains.
Fall-arrest lanyard	A double-lanyard attached to a full-body harness on one end and on 2 dedicated anchor points on the other end, and that catches its user in case of a fall, effectively preventing the user to crash on a below level. It may be fitted with a shock-absorbing device.
Fall-restraint lanyard	A lanyard attached to a full-body harness on one end and on a dedicated anchor point on the other end, which is of a short length and prevents its user from falling.
Hard-barrier	<p>A barrier made of means that cannot be moved or torn apart by a single person, e.g.:</p> <ul style="list-style-type: none"><li>- Guardrails as defined in 5.117;</li><li>- Sheet piles extending to a sufficient height to prevent access;</li><li>- Temporary fences with concrete footing;</li><li>- Concrete blockades ("Jersey barriers");</li><li>- Crowd control barriers;</li><li>- Water barriers (adequately filled with water or sand).</li></ul> <p>Note: warning tape and chains are not considered as adequate Hard-barriers and shall never be used as a protection mean.</p>
Hazardous atmosphere	<p>Confined Spaces, deep excavations and other areas with poor natural ventilation, where it has been identified that the atmosphere is or may be:</p> <ul style="list-style-type: none"><li>- Deficient in oxygen (less than 19.5% in volume), or;</li><li>- Enriched in oxygen (more than 23.5% in volume), or;</li><li>- Contaminated by flammable gases, vapours, fumes or mists at levels equal to or greater than 10% of the Lower Explosive Limit of the concerned substance, or;</li><li>- Contaminated by corrosive, harmful or toxic gases, vapours, fumes or mists at levels equal to or greater than their occupational exposure limit, accepted threshold limit value or dose (whichever is the lowest), or;</li><li>- Flammable / explosive (zone 0, 1, 20 and 21 – European &amp; IEC classification, Class I Division 1 and Class II Division 1 – North American classification), or;</li><li>- A combination thereof.</li></ul>
Heat Index	Combination of the Dry-bulb temperature and humidity levels, that helps to identify the levels of exposure to heat.



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Terms	Definition
High-Risk Activities	<p>Operational activity involving the following types of works:</p> <ul style="list-style-type: none"> <li>- Works on systems handed over to Commissioning</li> <li>- Works for which Lock-Out / Tag-Out (LOTO) must be performed</li> <li>- Works on live equipment or in their vicinity zone</li> <li>- Works in the live working zone of electrical equipment</li> <li>- Excavation works</li> <li>- Works at height</li> <li>- Working on or near floor openings</li> <li>- Erection, modification and dismantling of scaffolds</li> <li>- Works in potentially hazardous atmospheres (including but not limited to oxygen-enriched, oxygen-deprived, flammable or explosive, toxic atmospheres)</li> <li>- Works in Confined Space</li> <li>- Lifting operations</li> <li>- Hot works</li> <li>- Works requiring the handling or use of hazardous substances</li> <li>- Pressure testing with pressurized fluids or gases</li> <li>- Works near, above or under water</li> <li>- Works involving a risk of interference with moving vehicles</li> <li>- Lone working</li> <li>- Works with exposure to radiations (ionizing or non-ionizing)</li> <li>- Installing, servicing and operating machines</li> <li>- Activities involving the transport, handling or use of explosive charges</li> <li>- Civil works</li> <li>- Overhead Line works</li> <li>- Working in extreme temperatures</li> </ul>
Hot works	<p>Hot work is any work that involves burning, welding, using fire- or spark-producing tools, or that produces a source of ignition.</p> <p>This includes but is not limited to: welding, gas cutting, grinding, tar boiling.</p> <p>Note: the production of a source of ignition depends on the ignition temperature of the flammable material exposed to it.</p> <p><u>Example 1:</u> the electrical motor of a non-sparking portable power tool such as a drilling machine is generally not an ignition source in a normal atmosphere, but may become one in an explosive atmosphere.</p> <p><u>Example 2:</u> heating elements for pre- and post-weld heat treatment are intrinsically not ignition sources, however the heat they radiate or the heat conducted by metal can become an ignition source for wooden pipe supports, or other flammable material.</p>
Individual fall-prevention	System relying upon a person wearing a full-body harness, attached with a Fall-restraint lanyard to an anchor point. The short size of the lanyard and its low elasticity effectively prevent the user to fall.
Individual fall-protection	System relying upon a person wearing a full-body harness, attached with two Fall-arrest lanyards to anchor points. The size of the lanyard and the fact that it is often equipped with a shock absorber will catch the user during the fall, therefore reducing its severity.



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Terms	Definition
m, s, kg, N, etc.	All units used in this document are the base or derived units of the International Standard of Units, with the exception of the decibel (dB).
Machine	General term used to define any equipment with machinery components, excluding portable powered tools.
Machinery	An assembly fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application (it includes but is not limited to: pumps, motors, shafts, ...).
Operational site	All sites (including non-GE GPS sites) excepting office buildings.
Portable power tool	Work equipment or tool that is not stationary and that can be operated by one person, and that is actuated by a power source other than manual labor.
Primary safeguarding	Primary safeguards are: <ul style="list-style-type: none"> <li>- Guards that provide a physical barrier in order to prevent access to dangerous parts of machines;</li> <li>- Devices that detect the intrusion into dangerous zones or contact of persons with dangerous parts of machine and stop the machine from operating (e.g. light curtain, interlock).</li> </ul>
Project-Site	A location where GE GPS undertakes the installation, and/or construction, and/or commissioning, and/or technical advisory thereof for a final customer.
Quarantine (of equipment)	The operation that consists at removing a defective or otherwise unsafe item of equipment from the workplace, so it cannot be used inadvertently.
Secondary safeguarding	Secondary safeguards are: <ul style="list-style-type: none"> <li>- Emergency shut-down systems, automatically operated (i.e. set-off upon detection of an incident) or manually operated (that require a voluntary operation to be set-off) and that effectively stop the machine from operating;</li> <li>- Devices which do not automatically stop the machine from operating, but which reduce the likelihood of persons entering dangerous areas or making contact with dangerous parts (e.g. warning signals, perimeter fencing).</li> </ul>
(electrical) Shunting / short-circuit / bypass	Creating a short connection between 2 parts of a circuit, 2 pieces of equipment, etc. in order to ensure the 2 parts have the same electrical potential and that there can be no electrical discharge between them. In the context of EHS, this technique is used to prevent electrical sparks or arcs between 2 pieces of equipment, should they become charged differently.
"So far as is reasonably practicable" and other equivalent terms	All means must be employed to comply with the concerned requirement. If this is not possible, it shall be justified in writing.
Tier 1, 2, 3 business	Tier 1: GE Energy Connection (EC) Tier 2: GE EC – GPS Tier 3: Regions & Product Lines



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Terms	Definition
Voltage levels	In absence of Country regulations that define voltage levels: <ul style="list-style-type: none"><li>- Extra Low Voltage : &lt;50 V AC or &lt; 100V DC</li><li>- Low Voltage : &lt;1000 V AC or &lt; 1500V DC</li><li>- High Voltage : &gt;1000 V AC or &gt; 1500V DC</li></ul>
Work at Height	Work in any place, including at or below ground level, where without suitable control measures, a person or object could fall a distance liable to cause injury to themselves or persons underneath, or damage to property underneath. This specifically excludes stairways and works on a level ground.
Banksman	A competent person, helping drivers of vehicles to maneuver safely, and warning other vehicles and pedestrians of the maneuver.

### 5. Requirements and Stipulations of the Directive

#### 5.1 Access to and from the workplace

- 5.1.1 The Project Leader will implement a site access control process and means according to the requirements identified in the contract and any GE Security assessment. An entry gate pass process should be used to control any materials/tools/equipment/vehicles/chemicals entering the site. This is particularly important in relation to off duty hours including holidays. The purpose of the process is to:
- ensure that site employees and any other persons being authorized to enter the site have received the proper level of information regarding site risks and EHS requirements,
  - prevent members of the public or any other external party from gaining access to the site (where they may be injured due to site activities),
  - ensure that plant and equipment entering the site are in safe condition,
  - ensure security of site employees and equipment,
  - provide a means of accounting for personnel in each area in the event of an emergency.
- 5.1.2 GE will provide as part of the site traffic management plan details relevant for site access such as vehicle and pedestrian entrances, car parks, travel routes or speed limits.
- 5.1.3 Activities that may impair site access control (e.g. fence or access gate opening) or block any site access shall require a formal request to the SIM and shall be discussed during coordination meetings if relevant. In case of road closure, the request shall define arrangements for maintaining access to the emergency services.
- 5.1.4 Personnel access
- Any person accessing the site shall be duly authorized to do so, either through the induction process for site employees or sponsoring for visitors and deliveries. Animals shall not be authorised to access site.
- 5.1.5 Site employee access
- Contractors shall document any site access request for their employees and those of their subcontractors using a site employee access request form accompanied by the following attachments:
- EHS competency evidence
  - additional documents, such as but not limited to employment contract evidence, social insurance coverage.





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Such documents shall be provided to the nominated GE person in charge, **as a minimum 3 days in advance** of the planned arrival date, to enable proper planning of the site EHS induction. Exceptional derogations to this rule shall be validated on a case by case basis by the SIM. On the day of the induction the new site employees shall report to the site security personnel with proof of identity.

Following the successful completion of the site EHS induction and hand-over of the completed site employee access request form, a personal site ID card will be issued to site employees (subject to completion of the pre-start requirements for the concerned contractor).

GE will apply conditions to site ID cards functionality based on EHS induction validity and card usage (e.g. ID cards will be made inactive or withdrawn if not used for more than 2 months). Re-activation or re-issue shall be made by the security staff based on evidences provided by the contractor, to include either completion of a new EHS induction, or recorded briefing about current site conditions and any updated site EHS requirement as applicable.

Site employees shall only be provided with access to the site through the use of their site ID card. Site employees are required to have their site ID card in their possession at all times and display it upon request. Breaching the site access control requirements, including using another employee's ID card, shall be considered as a major deviation to the site requirements and shall result in consistent disciplinary measures.

Contractors are accountable for all contractor personnel's cards and must report losses or damages immediately to the site security staff. Site ID cards shall be returned to the GE site security staff on demand and in any case at site employee assignment completion. A fixed fee will be applied for lost, damaged or non-returned cards. In case of site employees presenting themselves at the site entrance without their site ID card a temporary ID card will be provided by the site security staff following necessary controls and upon security staff availability.

### 5.1.6 Visitors access

**Contractors shall formally submit to GE a list of persons authorised to take responsibility for complying with the visitor access process (Sponsors).**

Visitors shall report to site security to confirm the purpose of their visit and their sponsor. It's mandatory for visitors to have a known point of contact within GE, or contractors' site management/supervisory staff prior to attending the site. Access will not be granted otherwise. Following presentation by the visitor of an official means of identification, the sponsor shall be contacted by the security staff to inform them of the visitor's arrival. The sponsor shall then join the visitor at the security house to conduct a documented visitor EHS induction covering information on:

- site layout and traffic,
- general site rules (e.g. minimum mandatory PPE, smoking and mobile phone policy),
- emergency response and evacuation information,
- duties of visitors,
- site visitors risk assessment.

After receiving the visitor EHS induction, the visitor shall be provided with a temporary site visitor ID card. In some countries, visitors will be required to exchange the visitor ID card for a form of personal ID. The site visitor ID card shall only grant access to the site offices. The card shall be permanently displayed by the visitor while on site. The visitor shall also keep his site visitor EHS induction form and provide it back to the security staff together with his site visitor ID card at site departure in return for their personal ID.

Whenever visitor access to operational areas (construction site or laydown area) would be required, a formal visitor access request shall be prepared and sent by the sponsor to the GE SIM





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normally 24 hours in advance. Once completed (either accepted or rejected), the request shall be forwarded to the security personnel for further use / archive.

**On sites where there is no segregation between offices and operational areas, the SIM shall define if the formal visitor access request process shall be used for all visitors.**

It's the duty of the sponsor to ensure permanent escort of the visitor and compliance to the site EHS requirements from the visitor. Misuse of the visitor access rights or EHS deviations from the visitor shall result in appropriate disciplinary measures against the sponsor as a minimum.

GE will apply limitation rules for visitor access (e.g. a person requesting visitor access on more than 5 occasions or staying for more than 3 consecutive days should be deemed permanent and, as such, shall fulfil the requirements described in section 5.1.5). Site visitor ID cards shall only be valid for a maximum duration of one day and during normal site working.

Attendance at site of visitors shall be for work-related reasons. Family or relatives will not be accepted as visitors. Visitors shall not be allowed to enter the site with their vehicle.

Representatives from statutory authorities with legal rights to access site shall not be requested to fill in the Site Visitor Access Request but will follow the other processes mentioned above.

### 5.1.7 Vehicle access

Vehicle access shall be limited to vehicles required for safe and efficient execution of the works or deliveries requiring access to the workplace due to their size, weight or other hazardous properties. When accessing or leaving site using vehicles, the rule 'one vehicle – one driver' shall be applied unless specific means have been provided and enforced to ensure all vehicle occupants are authorized for site access and tracked by the site security database.

All vehicles on site shall be roadworthy and displaying a current registration certificate/sticker. Vehicles becoming un-roadworthy whilst on site shall be repaired in a timely manner or will have their access approval cancelled and be removed from site.

All vehicles (including private cars) can be subject to security searches.

### 5.1.8 Site vehicle access

#### 5.1.8.1 Construction vehicles

To enable construction vehicles to gain site access, contractors shall submit to the SIM a completed site vehicle access request **at least 24h prior to the expected date of entry**. The form shall be accompanied by all current certificates and inspection records. Upon access acceptance, the construction vehicle shall be parked when arriving at site in a dedicated area for further joint inspection by the SEHSM or nominee and a competent contractor representative. If during the inspection defects are noted, a further inspection will be required following rectification of the defects. In such circumstances vehicle entry will only be provided once defects are rectified to the satisfaction of the SEHSM.

Following successful inspection, dedicated signage shall be posted on the construction vehicle displaying a validity date corresponding to the next due date for inspection. It shall be placed to allow easy identification by the site security personnel for site access and by anyone during site EHS inspections.

Renewal of access request can be given by the site security personnel upon provision of a new inspection record for the construction vehicle. Such renewal shall be recorded on the concerned site vehicle access request form and a new sticker applied.

#### 5.1.8.2 Company and private vehicles



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Permission for vehicle access to site and car parks located inside the site access control boundaries shall be formally requested to the GE Site Management. GE will apply restrictions in number of vehicles authorized by contractors based on contracted scope volume and available parking space.

Private vehicles shall not be used in laydown or construction areas. Company vehicles may only be used in such areas if they are required to perform the activity (e.g. workshop vehicles) or for spot deliveries when it's not reasonably practicable to use a construction vehicle.

A means of identification confirming authorized access shall be visibly displayed within the vehicles.

### 5.1.9 Deliveries to site

Contractors shall formally submit to GE a list of competent sponsors taking responsibility for complying with the site deliveries process.

At site arrival and after presentation of transport documents supporting the site delivery, the security staff shall contact the company concerned to request a sponsor manage the delivery. It's the duty of the sponsor to:

- check the condition of the vehicle and the load prior to entry. If found in a condition preventing safe unloading, the site access shall be refused and action taken by the sponsor to send back the vehicle for further correction,
- ensure the delivery driver is equipped with personal protective equipment as required in section 5.63.
- provide a documented EHS induction to the driver. The sponsor shall ensure that the content of the EHS induction is understood by the driver. GE will provide site visitor EHS induction in the site languages. If not available, translation to other languages shall be made by the concerned contractor.

Once successful checks and EHS induction have been performed, the delivery driver shall be provided with a temporary site visitor ID card and processes applied as per section 5.1.6 allowing entry to the construction site and/or laydown area. Driving licenses should be used as the mean of identification and proof of competency.

As for visitors, the sponsor is fully accountable for the drivers' acts and each contractor shall ensure that deliveries are covered within their risk assessments.

Contractors and the SIM shall define an agreed process for the issuing of ID cards to delivery drivers in order to facilitate site access should regular deliveries be planned (e.g. fresh concrete deliveries, soil or waste removal).

### 5.1.10 Parking

Where possible, contractors shall manage transport of its employees to and from site in company vehicles or public transport, not private cars...

All vehicles shall be parked in the assigned parking area, with the exception of vehicles used for construction work.

### 5.1.11 Removal of goods and equipment from site

Personnel who wish to remove material from the site must first obtain permission from the relevant contractor Site Manager or authorized representative. Final approval shall be obtained from the GE SIM.



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Site Security Personnel shall not release material from the site without an approved form in their possession which details/lists the respective material.

Site Security Personnel shall ensure that only material listed is removed from the site.

When large amounts of material are being removed from the site (containers, etc.) they may be inspected and sealed prior to the time of removal to reduce disruption at the site gate.

### 5.2 Aquatic works: Working over, on, or near water.

- 5.2.1 Whenever the site activities and/or personnel are exposed to risks associated with tidal movement, a site survey must be conducted that must address tidal movement, climate / seasonal changes, riverbed structure and other geomorphological and hydrological aspects. Work scheduling and the Task-based EHS Risks and Impacts Analyses must be adapted to the results of this survey.
- 5.2.2 All work platforms next to or over water must be protected with guardrails (see 5.117) to prevent persons and material falling into the water or work level below.
- 5.2.3 Access ramps must be:
  - At least 450mm wide;
  - Not sloped more than 1 in 3 (20 degrees);
  - Where slope exceeds 1 in 8 (6 degrees), have grips or anti-slip coating installed at regular interval to avoid slipping.
- 5.2.4 When used for working (not for transport), rafts and other vessels are considered work platforms. As such, they must be fitted with guardrails (see 5.117), life jackets (see 5.2.10) and appropriate rescue measures (see 5.2.12) must be prepared. The positioning and securing of vessels used as work platforms shall be supervised and undertaken by competent personnel.
- 5.2.5 No work at height activities can take place on floating platforms such as boats or barges that are not fixed to the sea or river bed.
- 5.2.6 Floating platforms must have their maximum safe load and maximum number of occupants clearly displayed and this load must never be exceeded.
- 5.2.7 Working on floating platforms must be subject to a high control PTW.
- 5.2.8 Warning signs must be implemented to warn ships of work activities undertaken on water. These signs must be installed up- and downstream of the work location, at a sufficient distance and in accordance with the local legislation.
- 5.2.9 Consider the need for Safety Nets when structural design, loading access, worker mobility, or other factors make guardrails and fall arrest systems impracticable (see 5.120).
- 5.2.10 Lifejackets and Personal Flotation Devices:
  - 5.2.10.1 Workers must wear a lifejacket when working over or adjacent to water (i.e. within 3 meters of a water way), including when being on-board a ship or vessel of any sort, but excluding when using a bridge as a passageway.
  - 5.2.10.2 As with any personal protective equipment, daily checks and regular inspections and maintenance must be carried out to ensure the equipment is in reliable working order.
  - 5.2.10.3 Lifejackets must provide 150N / 16kg of buoyancy, suitable for unconscious persons, and as such must comply with requirements of EN396, ISO 12402-3, or equivalent.
- 5.2.11 Lifebuoys:
  - 5.2.11.1 Lifebuoys shall be available at all areas where persons are working over or near water.
  - 5.2.11.2 Standard 760 mm diameter lifebuoys should be placed in conspicuous positions near the water edge.



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- 5.2.11.3 Lifebuoys should be suspended from a hook or bracket with a line of 30 meters attached. They must be ready to be used by anyone (i.e. not locked).
- 5.2.11.4 Lifebuoys must be signaled clearly and visible from an appropriate distance, for instance by using signs posted at height indicating the lifebuoy's location.
- 5.2.11.5 Access to lifebuoys must be safe, unencumbered and well lit.
- 5.2.12 Rescue methods must be adapted to the foreseeable conditions and to the risks and impacts identified, and shall be written and communicated to all workers when working over or near water. Additional considerations for emergency planning must include:
  - Trained first aiders competent in approved cardiac pulmonary resuscitation method;
  - Audible alarms;
  - Sufficient lighting;
  - Two way radio communications;
  - High visibility clothing;
  - Regular headcount of personnel;
  - Periodic information about weather and tides;
  - Training in the use of rescue equipment and techniques;
  - Rescue lines and buoys;
  - Rescue ships when relevant;
  - AEDs and other rescue equipment that may be damaged by water shall be stored within sealed waterproof containers.
- 5.2.13 Whenever work equipment (fixed or mobile plant) may be damaged by contact with water, or when there is a risk of water being contaminated by hazardous substances being spilled or washed off, watertight barriers (e.g. sandbags) must be installed on the edge of the work platform.

### 5.3 Aquatic Works: Working underwater / diving

- 5.3.1 Competent, specifically qualified personnel must undertake all diving works.
- 5.3.2 Competency requirements for divers must include:
  - Knowledge of specific risks of this type of activity;
  - Knowledge of emergency scenarios and response procedures;
  - Selection and use of specific PPE;
  - Formal/official qualification for work in hyperbaric environment.
- 5.3.3 A dedicated Emergency Plan shall be available that covers all scenarios identified by the task-based EHS Risks and Impacts Analysis.
- 5.3.4 Appropriate means must be implemented to warn vessels and persons of the position of divers (e.g. flags, buoys).
- 5.3.5 Appropriate means must be implemented to effectively prevent vessels to collide with underwater workers, so far as is reasonably practicable. This may include floating barriers, nets, etc.
- 5.3.6 Dive tables mentioning timing at each decompression stage shall be available, known, and complied with.
- 5.3.7 Communication means shall be available for divers and between divers and boat/shore staff.
- 5.3.8 Specific PPE shall be available: protective clothing, breathing apparatus, emergency breathing apparatus with accessories appropriated to emergency intervention.



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### 5.4 Areas with potentially explosive atmospheres ("ATEX Zones")

- 5.4.1 The number, size and risk level of ATEX Zones must be reduced by design, so far as is reasonably practicable.
- 5.4.2 GE GPS shall provide advance notice to all site stakeholders that gas, fuel or other potentially explosive substances are to be introduced to a workplace. This will detail:
- The type and character of potentially explosive substances;
  - The location of areas with potentially explosive atmosphere/s;
  - The delimitations of such areas.
- 5.4.3 ATEX Zones shall be identified in line with the local legal requirements, indicated with suitable warning signs and their access shall be physically prevented. Signs shall include warnings about the nature of the area, and the main control measures (e.g. "no naked flames").



Figure 1: Examples of signs that mark an ATEX Zone

- 5.4.4 A map of all ATEX Zones, their risk level and physical boundaries must be maintained up-to date at site, and communicated regularly to all site stakeholders (including but not limited to: GE employees, Sub-contractors, Customer, partners).
- 5.4.5 Works in ATEX Zones of any risk level must be avoided, so far as is reasonably practicable (for instance by planning the works to be performed in the ATEX zone during an outage, or whenever the system has been isolated and made inert). If it cannot be avoided, the following control measures must be implemented:
- The use of gas detectors and/or explosion meters, appropriately calibrated and set;
  - The use of non-sparking, intrinsically safe, explosion-proof rated tools and equipment (including communication equipment);
  - The prohibition of all sources of ignition such as lighters;
  - Electrical shunting and grounding of all metallic stationary equipment,
  - The use of thermal motors is forbidden in the area (including vehicles);
  - The use of anti-static PPE, conductive safety shoes associated with conductive and grounded mats;
  - The prohibition of removal of clothes;
  - The prohibition of use of any synthetic fabric.
- 5.4.6 The access to ATEX Zones must be restricted to specifically authorized personnel, and the implementation of all requirements defined in 5.4.5 must be verified at the access control points.
- 5.4.7 Hot works within an ATEX Zone of any risk level, may only be conducted where the flammable / explosive substance has been fully removed and while the installation has been rendered inert, and this can be maintained throughout the works (for instance by implementing a Lockout / Tagout process), so far as is reasonably practicable. If this is not possible, the activity must be controlled by a high control Permit to Work (general Permit to Work when the works are performed within 10 meters of the boundaries of the ATEX Zone).



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- 5.4.8 Enclosed or semi-enclosed grinding, wood-working or de-burring machines produce dusts that may generate an explosive atmosphere. Such machines shall be fitted with dust extraction and collection systems, and these systems and their associated ducts must be fitted with explosion relief panels. These systems must be designed by competent persons and thoroughly inspected at least every 12 months by a competent and recognized 3<sup>rd</sup> party.
- 5.4.9 Any person working in a live ATEX area shall be equipped with flame-resistant clothes compliant with ISO 11612 or NFPA 2112.

### 5.5 Asbestos

- 5.5.1 No purchases shall be made for any equipment or materials containing asbestos of any kind.
- 5.5.2 If the presence of asbestos-containing material is suspected, then the following actions should be taken whilst observing local legislation:
- Vacate and cordon-off the area;
  - Request inspection and tests to be conducted by an organization specifically qualified for such, to confirm and quantify the presence of asbestos.
- 5.5.3 Where it has been determined by a specialist organization that asbestos is present on site, then a plan to prevent exposure of persons to asbestos fibers must be designed by the specialist organization and formally accepted by the GE GPS EHS Leader. Measures may include but shall not be limited to those described in 5.36 and 5.37.
- 5.5.4 Where the decision is taken to leave the asbestos-containing material in place, appropriate means must be employed to prevent any deterioration of it.
- 5.5.5 Where the decision is taken to remove the asbestos-containing material only a qualified asbestos contractor must do this.

### 5.6 Cement and lime-based products

- 5.6.1 Cement and lime-based product mixers and concrete trucks shall only be washed-out into an authorized purpose made holding pond or discharge area or by another approved means under applicable law.
- 5.6.2 Cement and lime-based product mixing shall be sited at least 10 m from a watercourse or surface water drain.
- 5.6.3 Dry concrete waste shall be re-used as inert rubble at a location approved by GE GPS, if not it shall be removed as described in 6.
- 5.6.4 Handling, mixing, laying, and breaking materials containing cement and lime based products can cause serious harm to the skin and respiratory tract. The appropriate industrial hygiene measures must be taken in accordance with 5.36. Civil works (including reinforcement, falsework, formwork)

### 5.7 Civil Works (including reinforcement, falsework, formwork)

- 5.7.1 Protruding reinforcement bars must be protected against impalement with appropriate caps (see **Error! Reference source not found.**) or any equivalent secured means, whenever such a risk exists.





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Figure 2: Protruding reinforcement steel with protective endcaps. Picture by Paul Goyette, CC-BY-SA-2.0

- 5.7.2 Personnel shall not walk on reinforcement bars or structures made thereof. For large foundation rebar areas, wooden planks or plyboards should be used for traversing from area to area to spread the load of the persons on a wide area of the structure, and to prevent persons falling and becoming trapped or injured between bars.
- 5.7.3 When lifting bundles of reinforcement steel, the bundles must be tied together securely to prevent slipping. In addition, an appropriate rigging method must be used that ensures a sufficient angle between the sling legs.
- 5.7.4 Falsework and formwork shall only be used within their designed load bearing capacity.
- 5.7.5 Indiscriminate dumping of fresh concrete shall be strictly forbidden and be properly disposed as described in 5.108.
- 5.7.6 The installation of washing facilities for concrete trucks shall be considered and designed in a way that the waste water is treated before release (see 7 and 5.1108).
- 5.7.7 When hoses are attached to concrete buckets being lifted or concrete pumps, it must be ensured that they are completely empty of concrete before being lifted, as concrete may pack-up in the hose and suddenly fall.
- 5.7.8 Temporary structures used to support formworks & slabs during civil works should:
- be stable with sufficient lateral resistance in all directions (jacks are braced )
  - ensure all jacks are precisely centered under battens
  - ensure all jacks used are vertically aligned.
- 5.7.9 Never stand directly below a temporary structure when concrete is being poured.
- 5.7.10 Formwork, shoring work, braces and any other support must not be removed until it has been determined through an approved method that the concrete has gained sufficient strength to support its own weight and all superimposed loads.

### 5.8 Confined spaces – identification, access prevention and work planning

- 5.8.1 So far as is reasonably practicable, the design, purchase, installation and construction of facilities, systems and equipment must consider the elimination of all Confined Spaces that could require entry at any time of the life phase of the facility, system or equipment.
- 5.8.2 All Confined Spaces must be clearly sign posted at each entry point: "Confined Space, access forbidden to unauthorized personnel" or equivalent, in languages understandable by the entire workforce.



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- 5.8.3 Physical means to prevent any unauthorized entry into Confined Spaces, preferably lockable, must be installed whenever the Confined Space is unattended.
- 5.8.4 All Confined Spaces must be logged onto a register, that shall also include their exact location, the number and location of the access points, any specific hazards and whether they should be considered as permanent Confined Spaces, or if their classification depends on the activities conducted within or around it. The register must be maintained up to date and readily available to all site personnel.

### 5.9 Confined Spaces – entry requirements

- 5.9.1 Entry into Confined Spaces may only be considered when all other alternative options (e.g. modify the Confined Space so that it no longer meets the definition of a Confined Space, perform the work from outside, remotely or not at all) have been considered and deemed as not reasonably practicable.
- 5.9.2 A competent operational supervisor shall be formally appointed to supervise each work activity where access to Confined Spaces is required.
- 5.9.3 A high control PTW must be established before entry and/or work within a Confined Space commences.
- 5.9.4 A dedicated attendant must be posted at each entry point
- 5.9.5 Only confined space competent persons may be authorized to enter and/or work in a Confined Space.
- 5.9.6 The attendant must use a Confined Space Entry-Exit Log (or equivalent) to identify the persons inside the Confined Space at any given time.
- 5.9.7 Entering and/or working in a Confined Space without an attendant are strictly forbidden.
- 5.9.8 The attendant must receive adequate training, that must include, but shall not be limited to, their responsibilities associated with controlling access to and egress from the Confined Space, maintaining communication with those inside the Confined Space, and the appropriate behavior in case of emergency situations.
- 5.9.9 The attendant shall never enter the Confined Space, except in emergency situations, if and only when he/she has been specifically trained and equipped to do so.
- 5.9.10 Adequate means of communication must be used, that shall enable easy and clear communication:
  - Between those inside the space;
  - Between those inside the space and those outside (attendants) to summon help in case of emergency.
- 5.9.11 Prior to any entry into the Confined Space, it must be physically isolated from any source of energy or material that could generate a risk to entrants, with the application of an appropriate Lockout / Tagout procedure (see 5.55). Sources of risk include, but are not limited to: ingress of hazardous substances, ingress of substances that could crush, constrict or engulf a person, heating / cooling sources, movement of machines.
- 5.9.12 The atmosphere in the Confined Space must be made safe, so far as reasonably practicable, in accordance with the requirements of the task-based EHS Risks and Impacts Analysis and of section 5.35, and it must be adequately monitored. The atmosphere in a confined space should be considered within acceptable limits whenever oxygen is between 19.5% and 23.5%, flammability is confirmed as less than 10% of the Lower Explosion Limit, carbon monoxide is less than 25ppm and toxic materials are below GE specified limits, or local regulations if more stringent. A calibrated, direct reading device should be used to test the atmosphere.
- 5.9.13 Where there is a risk of fire, appropriate fire extinguishers must be kept in the Confined Space and at the entry point.

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- 5.9.14 Adequate lighting, that includes emergency lighting, must be provided.
- 5.9.15 Care must be taken that the lighting means are intrinsically safe, when used in flammable or explosive atmospheres (see 5.4)
- 5.9.16 Wherever it is expected that there may be large areas of contact between the conductive enclosure of the Confined Space and the entrants (e.g. inside metal tanks), suitable precautions to prevent electric shock must be taken, such as using pneumatic tools instead of electrical tools, task lighting of the lowest possible voltage (not greater than 24 V so far as is reasonably practicable) connected to residual current devices and/or ground-fault circuit interrupters.
- 5.9.17 Only the tools and equipment necessary for the task may be taken into a Confined Space.
- 5.9.18 Cylinders containing oxygen and acetylene (or other fuel gas) shall not be taken into confined spaces.
- 5.9.19 The work area in a Confined Space must remain clean and tidy.
- 5.9.20 A safe, quick, unobstructed and ready means of access/egress/emergency shall be maintained throughout the works.
- 5.9.21 Entering and/or working in a Confined Space without all required controls in place are strictly forbidden. If any deviation to the agreed controls is observed or arises during the work, all works must stop, the Confined Space must be evacuated, and the Permit to Work suspended until further notice.
- 5.9.22 Prior to closing a Confined Space:
- An inspection of the Confined Space is carried out to confirm that there are no persons inside;
  - The person in charge of the works (Permit Holder) must ensure that all personnel, tools and equipment are removed from the Confined Space;
  - All members of the Confined Space working party must be accounted for;
  - The Permit Issuer for the works in the Confined Space must ensure that, when personnel are withdrawn, they are instructed not to re-enter the Confined Space;
  - All physical means to prevent unauthorized entry (see **Error! Reference source not found.**) must be put back in place.

### 5.10 Confined spaces – emergency situations

- 5.10.1 A task-specific rescue plan, based on a risk assessment, must be prepared for all works in Confined Spaces.
- 5.10.2 Retrieval systems or methods that support rescue without entering the Confined Space must be used so far as is reasonably practicable, and so far as the retrieval equipment does not increase the overall risk of entry.
- 5.10.3 Whenever they are used, retrieval systems must meet the following requirements:
- Each entrant shall use a full body harness, with a retrieval line attached on one end at the center of the entrant's back, and at the other end to a lifeline near shoulder level or at another point which the supervisor determines is appropriate for the successful removal of the entrant, and;
  - The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the Confined Space in such a manner that rescue can begin as soon as the attendant becomes aware that rescue is necessary, and;
  - A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 1.5 meters deep.
- 5.10.4 The required rescue equipment must be available at the Confined Space entry point prior to starting the works.



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- 5.10.5 The existence, adequacy, availability and response times of emergency services, must be confirmed before starting the works. Where there is a risk of asphyxiation, the target response time for emergency response shall be less than 4 minutes.
- 5.10.6 Emergency arrangements must be periodically tested either by real-scenario simulations (where practical) or other means such as audits, inspections or desktop reviews. For large Confined Spaces or those Confined Spaces where works are planned to be executed during a significant duration (i.e. more than 1 shift), it is recommended that their emergency arrangements are tested before the first entry or as early as possible after the works have started.

### 5.11 Cooling towers, closed-circuit water spraying and air-conditioning systems

- 5.11.1 Routine sampling of aerobic and legionella bacteria must occur at least every 3 months.
- 5.11.2 If the aerobic bacteria count (colony-forming unit (CFU) per milliliter at 30°C, after 48 hours of incubation) is higher than 10'000 or legionella bacteria count (CFU per liter, same conditions) is higher than 1'000, it shall be considered that there is an outbreak of bacteria breeding. In this case, immediate actions shall be taken to reduce the likelihood of persons to be exposed to the bacteria (e.g. restrict the area, shot dose of bactericide), a treatment plan must be implemented, and sampling frequency must be increased to at least once per month.
- 5.11.3 If the aerobic bacteria count (see conditions here above) is higher than 100'000 CFU/mL or legionella bacteria count higher than 10'000 CFU/L, the above measures must be complemented by an immediate shot of the appropriate biocide.
- 5.11.4 Sampling of aerobic and legionella bacteria must be undertaken by a competent organization specifically qualified for such.
- 5.11.5 Air conditioning units' condensate systems and trays must be inspected and cleaned at least once every 3 months, to ensure that there is no stagnant water that could create an environment favorable to the breeding of bacteria.

### 5.12 Dangerous Goods Shipping

- 5.12.1 Shipping of dangerous goods must be done in strict compliance with the applicable legislation, including for signaling the vehicles.
- 5.12.2 If there is no legal prescription for the signaling of vehicles transporting hazardous goods, the rules established in the most relevant of the following international regulations shall apply:
- international UN ADR Treaty (transport by road), or;
  - IMO International Maritime Dangerous Goods Code (transport by sea or navigable water ways), or;
  - IATA Dangerous Goods Regulations (transport by plane), or;
  - IOICR/OTIF Regulations concerning the International Carriage of Dangerous Goods by Rail (transport by rail).
- 5.12.3 Operators of vehicles used to ship dangerous goods must be competent and authorized drivers. In addition, they must be competent for the transport of dangerous goods, and qualified / licensed where required.
- 5.12.4 Copies of the Material Safety Datasheet (MSDS) of the dangerous goods being shipped must be available inside the vehicle.
- 5.12.5 Appropriate emergency arrangements and equipment must be in place in line with the requirements from the MSDS, and as a minimum for road vehicles:
- Instructions in writing for drivers and first-responders (sometimes referred to as "Transport Emergency Cards") must be displayed on the vehicle, and copies must be available with the shipment's documentation;



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- 1-wheel chock of a size suited to the maximum mass of the vehicle (when loaded) and to the diameter of the wheel;
- 2 self-standing warning signs;
- Eye-rinsing liquid for all classes of material except explosives and gases;
- High-visibility garment, eye protection and gloves for each member of the vehicle crew, in line with the requirements of 5.63 and 5.64;
- 1 flashlight for each member of the vehicle crew;
- An emergency escape mask for each member of the vehicle crew whenever substances identified as toxic are transported;
- A shovel, a drain seal and a collecting container for flammable (except those that may be liable to spontaneous combustion), corrosive and harmful for the environment solids and liquids;
- 1 or more fire extinguishers of the appropriate type, to tackle small fires not directly related to the hazardous substances being transported (e.g. brakes, batteries, motor compound).

### 5.13 Demolition, retrofit, refurbishment and works on “brownfields”

- 5.13.1 Demolition works shall only be performed by competent organizations, specifically qualified to perform this scope of work.
- 5.13.2 For demolition works, the relevant EHS Risks and Impacts Analyses must consider, but not be limited to, the following hazards and aspects:
- Falling materials/objects;
  - Uncontrolled structure or ground collapse;
  - Live services or stored energy (electricity, gas, water, etc.);
  - Stored or unreleased energy/tension within a structure;
  - Cranes and demolition machinery;
  - Noise and vibration;
  - Public road traffic;
  - Generation of dust;
  - Exposure to hazardous materials, e.g. lead, dust, asbestos, respirable crystalline silica, PCB, formaldehyde;
  - Use of explosives (see 5.30).
- 5.13.3 Before any demolition work, a competent person must perform a survey to determine the condition of the structure(s) and location of the existing utility networks. The competent person shall establish a demolition plan to determine the means of protection, isolation, removal and/or rerouting of utilities and the safe disassembly or demolition sequence, and any foreseeable emergency scenario and associated response procedure.
- 5.13.4 The demolition work shall be performed in accordance with the demolition plan. This plan is required for all demolition activities and shall include, but is not limited to, the following basic elements: schedule; scope of work being accomplished; description of work methods, equipment, job site and key personnel; site preparation; Waste Management Plan to include Asbestos-Containing Materials and other Regulated Material, Abatement Plan and Site Restoration Plan.
- 5.13.5 The use of explosives for demolition activities shall be considered as a last resort, to be done only when there is no safer alternative. Explosives must be used in line with the requirements of 5.30.
- 5.13.6 For retrofit and refurbishment works and general works on industrial brownfields, the following hazards and aspects must be considered in any relevant EHS Risks and Impacts Analyses:



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- Hazardous materials, e.g. lead, dust, asbestos, respirable crystalline silica, PCB, formaldehyde;
- Unexploded explosive ordnances;
- Pre-existing contaminated soil or groundwater.

5.13.7 Wherever it is suspected that material or equipment contain or are contaminated with asbestos, lead, PCBs, formaldehyde or any other hazardous substance, a competent person, qualified as per the local regulation, shall verify this assumption.

5.13.8 Whenever reasonably practicable, quantitative analyses must be performed to determine the potential exposure levels of persons, and control measures must be implemented to reduce the actual exposure, in line with the requirements of 5.42.

5.13.9 Removal, storage, transport and treatment of hazardous substances identified in **Error! Reference source not found.** must be done in strict compliance with local regulation.

### 5.14 Drugs and alcohol

5.14.1 The consumption of alcohol at the workplace is strictly forbidden.

5.14.2 The possession and/or consumption of controlled / prescription drugs that are not authorized by a competent Medical Doctor are strictly forbidden at the workplace, and offenders to this rule will face disciplinary actions.

5.14.3 When taking prescribed or over the counter medication an assessment must be undertaken to ensure there will be no impairment of fitness for work. Any prescription issued by a physician must be notified to the SEHSM, to ensure no impairment of the worker will be present.

### 5.15 Dust

Includes but is not limited to: sand dust, coal dust, coal ash dust, metal grinding dust, wood working dust, powder coatings, etc.

5.15.1 All hazards associated with the presence of dust must be considered in task-based Risks and Impacts Analyses. This may include, but is not limited to: poor visibility, irritation of the respiratory tract, ingress of dust in the eyes, potentially explosive atmosphere (see 5.4), etc.

5.15.2 The following control measures shall be considered, to reduce the exposure to dust:

- Laying the final / permanent tarmac on roads as early as possible, or installation of temporary coverings on dirt roads;
- Closing-up buildings as early as possible;
- Installation of wind barriers and coverage of the coal field / ash field, as early and so far as reasonably practicable;
- Regular water spraying on temporary dirt roads and storage areas;
- On-tool extraction, i.e. local exhaust ventilation (LEV) system that fits directly onto the tool and removes dust as it is being produced
- Dust control on operations producing a particularly high amount of dust (e.g. crushing plant, demolition activities, concrete mixing);

5.15.3 Dust masks and goggles shall be provided to potentially exposed persons and must be adequate for the amount and type of dust. Face fit testing is needed for tight-fitting masks.

5.15.4 Water spraying around the site boundaries may be considered as a measure to reduce the negative environmental impact of dust propagation out of the site.

### 5.16 Electricity consumption

5.16.1 Where the site is supplied by a utility company, the site must be equipped with at least one electrical meter to monitor its overall electrical consumption.



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- 5.16.2 Where reasonably practicable, movement detectors must be considered for lighting of walkways or non-permanently occupied areas.
- 5.16.3 Office buildings must be verified at the end of the normal working day to ensure lights are turned off wherever possible.
- 5.16.4 Energy efficient lighting and equipment must be used, so far as is reasonably practicable.

### 5.17 Electrical Safety for medium and high-voltage systems

- 5.17.1 Definition of Live Working Zone and Vicinity Zone for medium- and high-voltage systems

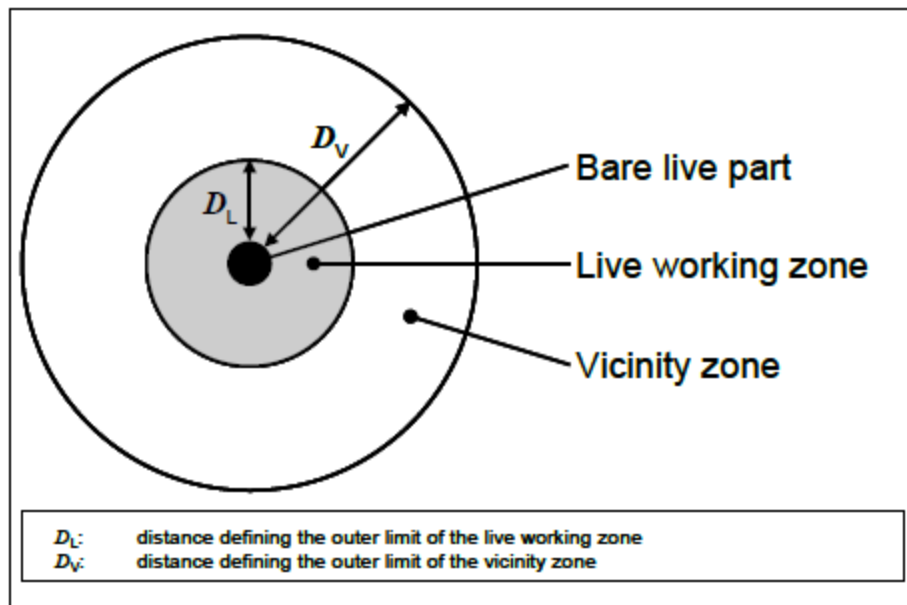


Figure 3: Distance definitions for live medium- and high-voltage systems Ref. EN 50110-1

On the above diagram:

- The grey shaded area shall be considered as the Live Working Zone, where no live works are allowed in any circumstances,
  - The Vicinity Zone area is, where any works undertaken within 10 meters (measured at ground level horizontally) from below a live high voltage conductor are considered as Electrical Works, and must therefore be controlled.
- 
- No individual may enter a live high voltage substation or approach closer than the vicinity distance of 10 meters measured horizontally to a live high voltage conductor unless they have been trained and have sufficient knowledge to avoid danger.
- 5.17.2 Individuals must not allow any part of their body or objects to approach within the boundary of DL, the specified Minimum Safety Distance(s), detailed in Tables 1 & 2, to exposed HV Conductor(s).
  - 5.17.3 When Isolation has been established and exposed Conductor(s) could still be charged at High Voltage the only objects permitted to approach within the specified Safety Distance(s), within the isolated zone established, are approved:
    - Voltage measuring/proving devices
    - Earthing Device(s) and their associated application devices
    - Discharge Lances



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5.17.4 When an isolated zone has been established and danger has been excluded by the application of Earthing /grounding within the isolated zone, encroachment within the specified Safety Distance(s) in Tables 1 and 2, is permitted under an appropriate Safety Document.

Table 1 – AC Safety Distances

Nominal System Voltage		Safety Distance 'X'
Up to and including	33kV	0.8m
Exceeding 33kV but not exceeding	66kV	1.0m
Exceeding 66kV but not exceeding	132kV	1.4m
Exceeding 132kV but not exceeding	275kV	2.4m
Exceeding 275kV but not exceeding	400kV	3.1m
Exceeding 400kV but not exceeding	550kV	4.4m
Exceeding 550kV but not exceeding	800kV	6.7m
Exceeding 800kV but not exceeding	1100kV	8.6m

Table 2 – DC Safety Distances

Nominal System Voltage		Safety Distance 'X'
Up to and including	80kV	1.2m
Exceeding 80kV but not exceeding	150kV	1.8m
Exceeding 150kV but not exceeding	300kV	2.7m
Exceeding 300kV but not exceeding	450kV	3.7m
Exceeding 450kV but not exceeding	600kV	5.1m
Exceeding 600kV but not exceeding	800kV	7.1m

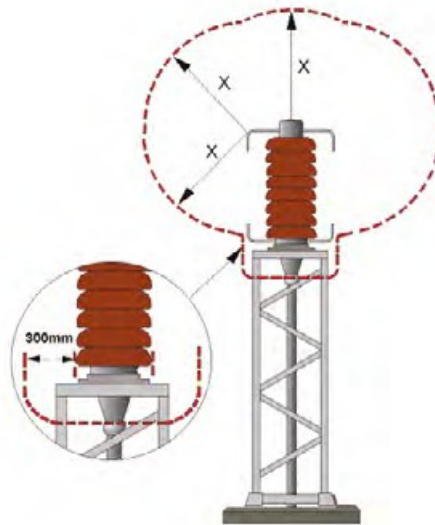


Figure 4. DL Safety Distance 'X' (from live high voltage conductors)

- 5.17.5 Distance of 300mm shall also be maintained from that part of the insulators supporting exposed unearthed High Voltage Conductors (see diagram above). Work within 300mm is classified as live working and is not allowed.
- 5.17.6 Where work is being carried out in the vicinity of live conductors using scaffolds or vertical working platforms, an application factor must be added to the Safety Distance to ensure no part of a person's body, or any object held by the person can infringe the Safety Distance 'X' surrounding the exposed HV Conductor(s) which will remain energised during the work activity. The application factors will be applied as follows:
- The minimum horizontal working clearance distance from any Live part shall be the sum of the relevant Safety Distance and the maximum horizontal reach of a person (taken to be 1.5m)





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- The minimum vertical working clearance distance from any live part shall be the sum of the relevant Safety Distance and the maximum vertical reach of a person (taken to be 2.4m)

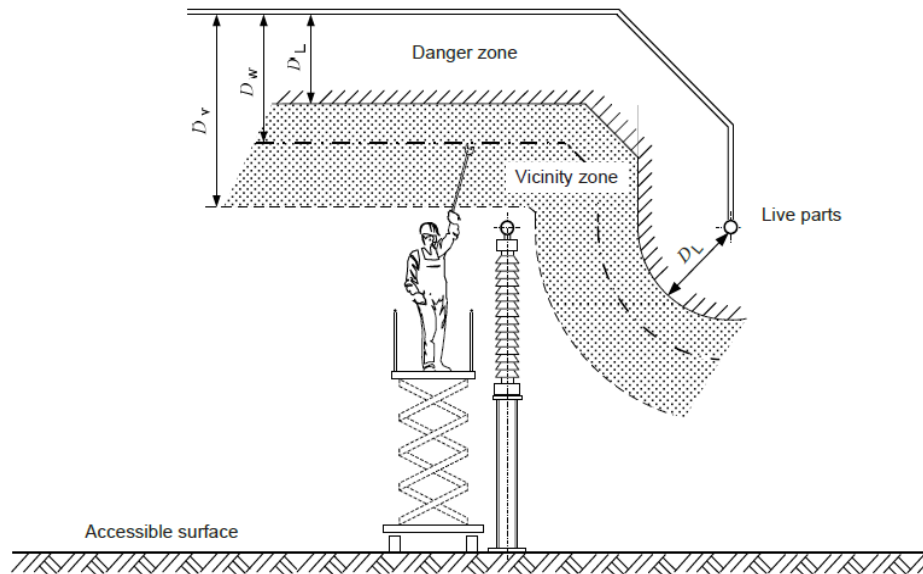


Figure 5. Minimum Working Clearances (Ref IEC 61936)

5.17.7 Tables 3 and 4 below specify the minimum  $D_w$  horizontal 'C' and vertical 'B' (see figure 6) Working and Access Clearances for scaffolds and vertical platforms and must also consider the tools/equipment being used and the nature of the work being undertaken.

Table 3 – AC Working Clearance distances

Voltage	Safety Distance 'DL'	Horizontal Working Clearance safety distance $D_w = D_L + 1.5m$	Vertical Working Clearance Safety Distance $D_w = 'DL' + 2.4m$
Up to 33kV	0.8m	2.3m	3.2m
66kV	1.0m	2.5m	3.4m
132kV	1.4m	2.9m	3.8m
275kV	2.4m	3.9m	4.8m
400kV	3.1m	4.6m	5.5m
550kV	4.4m	5.9m	6.8m
800kV	6.7m	8.2m	9.1m
1100kV	8.6m	10.1m	11m

Table 4 – DC Working Clearance distances

Voltage	Safety Distance 'DL'	Horizontal Working Clearance safety distance $D_w = D_L + 1.5m$	Vertical Working Clearance Safety Distance $D_w = 'DL' + 2.4m$
Up to 80kV	1.2m	2.7m	3.6m
150kV	1.8m	3.3m	4.2m
300kV	2.7m	4.2m	5.1m
450kV	3.7m	5.2m	6.1m
600kV	5.1m	6.6m	7.5m
800kV	7.1m	8.6m	9.5m



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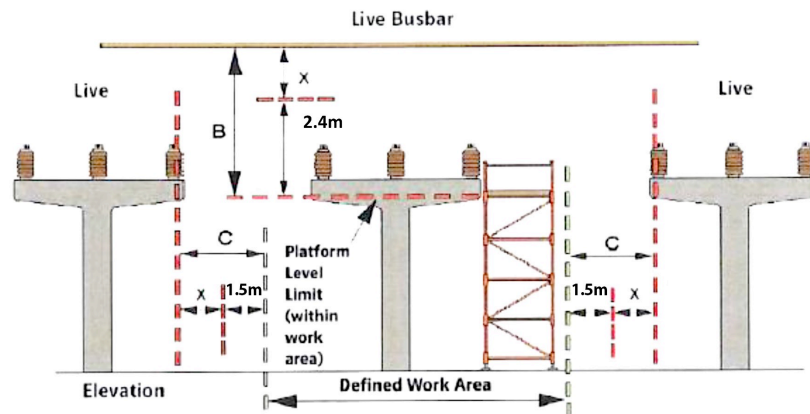


Figure 6. Working Access Clearance example.

- 5.17.8 Due to the risk of operator error or equipment malfunction when using a Mobile Elevated Work Platform (MEWP) in the vicinity to live conductors, additional clearances Shall be applied to ensure neither the MEWP, any part of the operator's body, or any object held by the operator can infringe the Working Distance Clearances surrounding the exposed HV conductor(s) which will remain energised during the work activity.
- The minimum horizontal clearance (DV) from any Live part shall be the sum of the relevant Safety Distance and the maximum horizontal reach of a person (taken to be 1.5m) plus an additional 1m margin for voltages  $\leq 110\text{kV}$  or a 2m margin for voltages  $> 110\text{kV}$  (Ref IEC 61936-1)
  - The minimum vertical clearance (DV) from any live part shall be the sum of the relevant Safety Distance and the maximum vertical reach of a person (taken to be 2.4m) plus a 1m margin for voltages  $\leq 110\text{kV}$  or a 2m margin for voltages  $> 110\text{kV}$  (Ref IEC 61936-1).
- 5.17.9 All works on High-voltage systems or in the Live Working Zone must be performed with the equipment isolated with Lockout/Tagout and the application of earthing/grounding. **No works on live high-voltage systems or in their Live Working Zone are allowed.**
- 5.17.10 Where practicable prior to applying earthing/grounding to isolated equipment, a verification of absence of voltage with suitable test equipment must be performed.
- 5.17.11 When performing works on isolated equipment, earthing/grounding must also be applied at the point of work.
- 5.17.12 The work area must be clearly defined with demarcation and where practicable it must be protected physically to prevent danger to individuals in the area from system hazards in proximity to the work area.
- 5.17.13 Only trained, competent and authorized persons can perform or supervise HV Electrical Works. Without such an authorization, no employee shall undertake HV Electrical Works.
- 5.17.14 Where there is a requirement to operate or work near energized electrical equipment, an initial risk assessment must be undertaken to identify the hazards associated with Arc Flash. Where the initial assessment indicates a potentially significant risk, an Arc Flash study must be undertaken to quantify the incident energy. The result of the arc flash study will identify the Arc Flash Protection Boundary (this is the closest approach allowed before Personal Protective Equipment (PPE) must be worn). Inside the Arc Flash protection boundary, a worker must wear the appropriate PPE.





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### 5.18 Electrical Safety for Low Voltage systems

- 5.18.1 When performing LV Electrical Works, the following shall be implemented:
- Isolation of all sources of supply to the circuit to be worked on with Lockout / Tagout;
  - Protection against direct contact with adjacent live parts: Screening insulation, non-conductive and antistatic or suitably grounded enclosures / fencing / barriers, distance, use of non-conductive tools;
  - Protection against indirect contact (contact with conductive materials that are themselves accidentally in contact with live parts): earthing of conductive materials, installation of residual current devices and ground-fault circuit interrupters, use of very low voltage, double insulation, rubber mats;
  - Personal Protective Equipment.
  - Assured grounding/earthing is required prior to work.
- 5.18.2 As a minimum, the following specific PPE shall be considered:
- Non-conductive clothes, gloves, glasses and shoes shall be worn when working on or near live parts. Gloves must be selected based on the work being done and level of risk.
- 5.18.3 It is strictly forbidden to use multimeters or Voltage sticks for performing a verification of absence of voltage.
- 5.18.4 Verification of absence of voltage must be undertaken with a two-pole voltage indicator which must be tested immediately before and after use with a voltage proving device.
- 5.18.5 Testing and commissioning, including functional testing, may be carried out with Low Voltage Equipment Live, provided that approved insulated tools and instruments are used and work is carried out by authorized staff to an approved procedure
- 5.18.6 Live work may be carried out on Extra Low Voltage electrically powered Equipment, but where reasonably practicable the equipment shall be made Dead.
- 5.18.7 Conductive articles of jewelry shall not be worn when performing Electrical Works.
- 5.18.8 All electrical rooms, energized panels and electrical cabinets must be closed and secured whenever they are unattended and tagged with the signs and warnings indicating the presence of danger.
- 5.18.9 If not reasonably practicable, a restricted area (physical delimitation supported by warning signs) shall be implemented around opened live equipment.
- 5.18.10 Barriers used for preventing access to live systems and made of conductive material must be earthed.
- 5.18.11 Where reasonably practicable an Automatic External Defibrillator must be available at locations where Electrical Works are being undertaken.
- 5.18.12 Where there is a requirement to operate or work on/or near to energized electrical Equipment, an initial risk assessment must be undertaken to identify the hazards associated with Arc Flash. Where the initial assessment indicates a potentially significant risk, an Arc Flash study must be undertaken to quantify the incident energy. The result of the arc flash study will identify the Arc Flash Protection Boundary (this is the closest approach allowed before Personal Protective Equipment (PPE) must be worn). Inside the Arc Flash Protection Boundary, a worker must be wearing the appropriate PPE.

### 5.19 Electrical Safety – Induced voltage in HV sub-stations

- 5.19.1 Care shall be taken when working on an isolated circuit in an electrical Substation which is in proximity to other live circuits, due to the risk of induced voltages on equipment even when not directly energized from the electrical system. A site-specific risk assessment must be undertaken



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to identify all potential Induced Voltage hazards. An Induced Voltage Earthing/grounding Schedule must be used to specify the Induced Voltage Earthing/grounding requirements for each stage of the work.

- 5.19.2 In an Electrical Substation or test area, vehicles and mobile Equipment may also accumulate electrical charge from Live adjacent circuits. To avoid potential risk of electric shock, explosion and fire, Earths/grounds Shall be applied to all vehicles and mobile equipment.

### 5.20 Electrical Safety – Trapped/capacitive charge in HV equipment

- 5.20.1.1 Prior to undertaking invasive works, the Authorised Person must ensure that trapped/capacitive charge is fully dissipated.
- 5.20.1.2 All HV Equipment, associated contacts and Conductors to be worked on, must be Earthed to ensure adequate dissipation of trapped/capacitive charge on every part of the HV Equipment.

### 5.21 Transformer Earth/Neutral Connections

- 5.21.1 Due to the possibility of capacitive charge accumulating in transformer windings, a discharge stick must be used to dissipate any stored charge prior to any work taking place on transformer connections.
- 5.21.2 Bridging earths must be applied whenever connections or disconnections of the transformer earth system are being carried out.
- 5.21.3 During oil processing or oil circulation in Transformers, it is possible for capacitive static charge to be accumulated in the transformer windings due flow electrification resulting from the circulation of oil.
- To manage this, hazard the following requirements must be complied with: -
  - Prior to commencing oil processing/oil circulation activities, verify that the transformer is connected to the site earth mat.
  - The oil treatment plant as well as any other equipment involved in the oil processes must also be connected to earth.
  - All hoses must contain internal static wires. The static wires electrical continuity between the fittings at both ends must be tested before each use
  - The external top terminals of the bushings must be earthed during oil recycling
  - Where permanent transformer earth connections must be removed temporary earths must be applied
  - Access control restrictions during oil processing must be in place to prevent access to exposed transformer connections.
  - Prior to working on transformer connections, a discharge stick must be applied to discharge any standing charge

### 5.22 Emergency preparedness

- 5.22.1 Signs must be clearly posted above emergency equipment, to indicate their position.
- 5.22.2 Full and unrestricted access to emergency exits, fire-fighting equipment, first-aid equipment, other emergency equipment, emergency alarms and emergency response vehicles must be maintained at all times.
- 5.22.3 Emergency exit doors must open in the direction of the escape route.
- 5.22.4 Emergency exit doors may be fitted with panic-bars so far as is reasonably practicable.
- 5.22.5 Construction sites must have a predetermined main muster point, and an auxiliary muster point, in place and indicated on the project site plan.



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- 5.22.6 A Fire Risk Assessment for the Construction site, laydown areas and Welfare facilities must be completed.
- 5.22.7 Emergency drills must be carried out to test the efficiency of the emergency arrangements and evacuation procedure at regular intervals.

### 5.23 Energized Equipment – Work on energized systems

- 5.23.1 See Lockout / Tagout (5.55), Plant, equipment and machines (5.65, 5.67, 5.69, 5.71, 5.72, 5.74, 5.75), Electrical safety LV (**Error! Reference source not found.**).

### 5.24 Ergonomics

- 5.24.1 All EHS Risks and Impacts Analyses must consider the following ergonomics hazards:
- Awkward postures (e.g. prolonged work with hands above head or elbows above shoulders, neck bent, squatting, kneeling, handling of objects with back bent/twisted, repeated or sustained bending or twisting of wrists, knees, hips, shoulders, way of sitting / standing, moving space);
  - Access into or working within awkward or tight spaces where bodily movement is constrained;
    - Forceful manual handling (lifting, pushing, pulling);
    - Prolonged repetitive movements;
    - Repeated contact with hard or sharp objects;
    - Prolonged exposure to vibration;
    - Organization of the workplace;
    - Lighting, quality of air, temperature, ambient noise;
    - General mobility (or immobility) during the execution of work activities.
- 5.24.2 All internal workplaces must be heated and / or ventilated so to maintain an appropriate temperature, so far as is reasonably practicable, for the activities being undertaken. Should it not be practicable, the requirements of 5.122 and 2 must apply.
- 5.24.3 Users of display screen equipment must be provided with a suitable working table, an adjustable seat, providing adjustable lumbar support.
- 5.24.4 The following equipment must be provided to laptop users at their main work location / workplace, so far as is reasonably practicable:
- A docking station;
  - An external monitor;
  - A keyboard;
  - A mouse or other suitable pointing system.
- 5.24.5 Any additional equipment (foot rest, adjustable table, joystick, etc.) shall be provided at no cost to the employee whenever required.

### 5.25 Excavations – buried services

- 5.25.1 Buried services include electricity cables, gas pipes, water and other pipes and sewers and telecommunications cables.
- 5.25.2 "As-built" drawings shall be reviewed prior to the start of digging any excavation to identify the presence, type and location of buried services.
- 5.25.3 If it is suspected that underground services are buried in a radius of 10 meters within the planned location of the excavation, or if a doubt exists regarding the accuracy of the as-built drawings, scanning for buried utilities must be performed with appropriate equipment operated by a competent person.



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- 5.25.4 The exact location of buried services shall be noted on the documents pertaining to the excavation (e.g. risk assessment, permit to work, Point of Work Risk Assessment) and marked on the work location in accordance with the local standards (flags, painted, etc.) prior to digging the excavation.
- 5.25.5 Hand digging must be considered when digging an excavation near a known buried service. Hand digging is mandatory when excavating near any flammable or explosive service. Use trial holes to confirm the position of any detected services. In some circumstances it may be necessary to de energize electricity cables.
- 5.25.6 Mechanical excavation must be carefully planned and managed. Where practicable, hand tools with curved edges should be used. These should be insulated when hand digging near electric cables. Other safe methods of excavation include vacuum extraction, which incorporates water jetting or high velocity air jets.
- 5.25.7 All exposed cables and pipes shall be adequately protected and supported when an excavation is opened.

### 5.26 Excavation Works – digging the excavation

- 5.26.1 Alternative methods to digging excavations must always be considered, such as micro-tunneling or directional drilling, so far as is reasonably practicable.
- 5.26.2 Soil surveys must be undertaken by competent organizations specifically qualified for such prior to the excavation, to identify:
- Potential soil contamination;
  - Presence of buried services (live or dead);
  - Risk of collapse of excavations;
  - Risk of water ingress;
  - Unstable ground and risk of sinkholes;
- 5.26.3 Excavations equal to or deeper than 1.2 m shall be protected from collapse/cave-in by adequate means, as designed by a competent civil engineer, based upon soil surveys, and other relevant factors. This may include, but should not be limited to the following means, or a combination thereof:
- Purpose built shuttering or shoring;
  - Sloping/battering/benching the excavation walls to a suitable angle;
  - Sheet piling;
  - Installation of trench-boxes;



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Figure 4: trench-box

- 5.26.4 When persons need to cross an excavation, a bridging walkway must be designed in accordance with local legal requirements and design codes, and must be erected with guardrails and toe-boards (see 5).
- 5.26.5 Vehicle and plant movement that is not in direct relation with the works in the excavation shall be kept a minimum of 3.0 m from the edge of any excavation.
- 5.26.6 Personnel must be kept clear of the vehicles / plant working in connection with the excavation works or the works inside the excavation, while they are in operation.
- 5.26.7 Vehicles / plant working in connection with the excavation works must have a banksman controlling their movement to prevent them from going close to the edge of the excavation, in order to prevent the edge to break away under their weight.
- 5.26.8 When vehicles / plant working in connection with the excavation works or the works inside the excavation remain stationary during part of the works, wheel-chocks must be used to prevent the equipment moving towards the excavation. In addition, hard-barriers made of concrete may be used to physically prevent any vehicles from falling into the excavation.
- 5.26.9 Excavators, when designed specifically for this purpose, may be authorized to lift equipment in place into an excavation. See 5.49.
- 5.26.10 The excavation shall be designed in such a way to ensure sufficient clearance to provide a distance of at least 60 cm between any workplace and any formwork, piping, or other equipment within the excavation.
- 5.26.11 Excavations must be dug in a way that there are no instances where the soil or banks hang over an excavated area.

### 5.27 Excavations – general requirements after digging

- 5.27.1 Excavations between 0.5 and 1.2 m in depth shall be protected at all times with Hard-barriers except where a safety distance of at least 1.5 m is maintained by visible safety chains or flexible mesh of 1.1m in height.
- 5.27.2 Excavations equal to or deeper than 1.2 m shall be protected at all times with guardrails and toe-boards (see 5.117). Toe boards are not required where the guardrails are positioned at least 1.5 m from the edge of the excavation.



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- 5.27.3 Guardrails and toe-boards shall be installed at a sufficient distance from the edge of excavations so that they would remain an efficient fall prevention control in case of reasonably foreseeable landslide or collapse of the excavation.
- 5.27.4 All means must be employed to prevent ingress of water into the excavation, and on its sides. In addition, water must be removed regularly so that it does not accumulate in the excavation pit.
- 5.27.5 All materials must be kept at least at a distance of 1.2 meters from the edge of the excavation.
- 5.27.6 Traffic routes shall be planned and diverted if necessary, and the installation of Hard-barriers made of concrete shall be considered in high-traffic areas.
- 5.27.7 Excavations may be considered as Confined Spaces (see 5.10) and may contain Hazardous Atmospheres (see 5.35).
- 5.27.8 Working on slopes or sides of the excavations above other workers is forbidden.
- 5.27.9 Backfilling and removal of trench supports should progress together from the bottom of the trench/excavation. Jacks or braces shall be released slowly and, in unstable soil, ropes shall be used to pull out the jacks or braces from above after personnel have cleared the trench.
- 5.27.10 - When vehicles or mobile equipment are used or allowed adjacent to an excavation, substantial stop logs shall be installed.
- 5.27.11 Excavations shall be re inspected by a competent person if conditions change (adverse weather, earthquake). A documented excavation inspection shall be completed prior to each shift.

### 5.28 Excavations – unstable ground and risk of sinkhole

- 5.28.1 When there is a risk of collapse or sinkhole (e.g. excavation dug near to the shore line) and if it is required to have pedestrian access along the edge of the excavation, only a dedicated platform, independent to the excavation structure and provided with guardrails and toe-boards (see 5), shall be considered. Such platform shall be fixed in such a way that if the ground stability is weakened, the structure remains stable and in position.
- 5.28.2 In case a platform cannot be installed, other means shall be implemented such as a life line system allowing an immediate rescue if someone fell into unstable ground.
- 5.28.3 Where the stability of adjoining buildings, walls or other structures is endangered by excavation works, support systems shall be provided such as shoring, bracing or underpinning.

### 5.29 Excavations - Access / Egress

- 5.29.1 All excavations shall be provided with safe access and egress. Ramps, steps and staircases shall be preferred to ladders.
- 5.29.2 In trenches (i.e. relatively narrow and long) equal to or longer than 15 meters, at least 2 independent means of access and egress shall be provided, and an additional access/egress point every 15 meters thereafter.
- 5.29.3 An access point shall be available at no more than 20 meters in any direction.
- 5.29.4 If ladders are used, they shall not be longer than 5 meters (excluding the 1-meter extension above access level), and be accessible within 10 meters of anyone in the excavation, in any direction.
- 5.29.5 Excavations greater than 5 meters in depth must be provided with dedicated staircases with guardrails (see 5.117).

### 5.30 Explosives

This section specifically excludes the use of explosive-powered tools, which are covered in 5.75





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- 5.30.1 Explosives may only be purchased, transported, used and disposed of by competent personnel, authorized by a statutory body, and in permanent and strict compliance with all applicable regulations.
- 5.30.2 Explosives shall not be stored on site, so far as is reasonably practicable. Should explosives be stored on site, the storage must be strictly compliant with all applicable regulations, be fitted with blast walls and pressure relief wall panels as appropriate, and be locked at all times when materials are not being delivered or collected.
- 5.30.3 Areas where explosives are used (and exposed to blast) must be free of debris and anything likely to be shattered or blown away by the blast and barricaded with clear signs reading (in English and all applicable site languages): "DANGER: USE OF EXPLOSIVES – ACCESS FORBIDDEN TO UNAUTHORIZED PERSONNEL".
- 5.30.4 Explosives shall only be transported and/or used during daylight.
- 5.30.5 A siren must be sounded as a minimum 5 minutes before the blast, requesting evacuation of exposed personnel. The area where people may be exposed to the blast must be searched for any remaining personnel and only upon the area being confirmed to be clear of any person, may the operation continue.
- 5.30.6 A siren must be sounded at the last 30 seconds before the blast, to announce the imminent explosion.
- 5.30.7 A siren must be sounded at the latest 30 seconds after the blast, to give the all-clear.

### 5.31 Fire prevention and protection

- 5.31.1 All flammable material (paper, wood, gasoline, etc.) must be kept at a minimum distance of 2 meters from sources of heat. Specific rules apply for the storage of hazardous substances (5.38) and for the execution of hot works (5.40).
- 5.31.2 Suitable firefighting equipment adapted to the specific fire risk must be available at work areas, and must be maintained in accordance with the applicable regulations.
- 5.31.3 Personnel must receive appropriate information about fire risks and must be adequately trained in the response to fire emergencies (as a minimum: raising the alarm and theoretical use of extinguishers).
- 5.31.4 "Hands-on" training for the use of first-response fire-fighting equipment must be delivered to at least 25% of the workforce of each company working on the site, including 100% of all storekeepers and persons undertaking or supervising hot works.
- 5.31.5 Only an absolute minimum of flammable material shall be kept at the workplace.
- 5.31.6 Flammable material or products shall be replaced with non-flammable material or products, so far as is reasonably practicable.
- 5.31.7 Any flammable material must be removed as soon as practicable after it is no longer required.

### 5.32 First-aid arrangements

The provision and maintenance of a Site first-aid facility does not relieve the employer from its obligation to provide adequate first-aid provisions in the workplace, as follows:

- 5.32.1 Personnel, procedures and equipment for first-aid must be based on the consideration of all site operations, shift patterns and hazardous processes (e.g. specific treatments to be kept on site for immediate response, such as calcium gluconate and calcium chloride in case of burns with hydrofluoric acid).
- 5.32.2 Each employer shall provide a minimum of one first-aider for up to 20 employees, and then one for every 20, or part thereof, employees thereafter. Where there are more than 1000 people on site during any one shift, a fulltime licensed physician will be provided on site.



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- 5.32.3 First-aiders shall hold an accredited first-aid certification equivalent to St. John's Ambulance, Red Cross or other nationally recognized workplace first-aid organization.
- 5.32.4 Each employer shall maintain a list of its first-aiders and medical personnel, including but not limited to their names and certifications.
- 5.32.5 All Site first-aiders and medical personnel shall be provided, by their respective employer, with a special identification form that allows for persons to identify them promptly in case of a medical emergency, e.g. green helmets, label on the helmet/high visibility vest, or as otherwise specified by GE GPS.
- 5.32.6 Workplace first-aid kits must contain, as a minimum:
- 1 guidance leaflet providing brief first-aid guidelines;
  - 1 list of the contents of the workplace first-aid kits, allowing for the verification that the workplace first-aid kit is complete;
  - A set of sterile dressings comprising of:
    - 4 sterile dressings of medium size (conforming bandage, min. 7.5 cm width and min. 2 m stretched length, with an absorbent of not less than 12 cm x 12 cm);
    - 1 sterile dressing of large size (conforming bandage, min. 10 cm width and min. 2 m stretched length, with an absorbent of not less than 18 cm x 18 cm);
    - 2 eye pad sterile dressings (conforming bandage min. 5 cm width and min. 1.5 m stretched length or elasticated looped bandage, with an oval pad of no less than 7 cm x 5 cm);
    - 40 sterile adhesive dressings, water resistant, individually wrapped (min. surface area of 7.5 cm<sup>2</sup>, dressing pad not less than 20% of the surface area);
    - 2 finger sterile dressings (conforming bandage, min. 3.5 cm width and min. 30 cm stretched length, with a dressing pad of min. 3.5 cm<sup>2</sup>);
  - A set of non-sterile dressings comprising of:
    - 2 triangular bandages (non-woven material or cotton, min. 20 grams per square meter, not less than 90 cm x 90 cm x 127 cm);
    - 1 conforming bandage (min. 7.5 cm width and 4 m stretched length);
    - 1 water-based gel-soaked burn dressing, sterile, that does not dry out within one hour of application (min. 100 cm<sup>2</sup> surface area);
    - 20 alcohol free moist cleansing wipes, individually wrapped, sterile (min. 80 cm<sup>2</sup>);
    - 6 safety pins (min length of 2.5 cm);
    - 1 roll of adhesive tape, individually wrapped (min. 2.5 cm width, 5 m length);
    - 6 pairs of medical disposable gloves, large size, conforming with EN 455-1 and EN 455-2 or equivalent;
    - 1 resuscitation mask (with a one-way valve), see Figure 5;
    - 1 foil blanket (min. 130 cm x 210 cm);
    - 1 pair of shears that is suitable for cutting clothing, including leather;
    - 1 pair of tweezers.





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Figure 5: Resuscitation mask. Picture by Rama, CC BY-SA 3.0

- 5.32.7 Workplace first-aid kits and eye wash supplies shall be available in proximity to all work areas.
- 5.32.8 An Automatic External Defibrillator must be available at all GE GPS operational sites, and one additional unit must be available at locations where Electrical Works are performed. They must be located in a way that competent personnel may be able to use them within 5 minutes after a person has started to show symptoms of ventricular tachycardia or fibrillation.
- 5.32.9 All GE employees who are at risk for exposure to bloodborne pathogens shall be offered hepatitis B vaccination (HBV) prior to beginning their assignment and every year thereafter, if they decline the offer.

### 5.33 Flushing of systems (including chemical cleaning)

- 5.33.1 The following hazards are present during flushing and chemical cleaning operations, and the relevant control measures are described in the associated sections:
  - Pressure equipment (5.71),
  - Pressure test (5.77, 5.78),
  - Use of hazardous substances (5.36).
- 5.33.2 Flushing / cleaning medium may be considered as hazardous waste after the operation, in which case it must be treated as such (see 2, 3, 4, 6).
- 5.33.3 The flushing and cleaning of systems using flammable substances as flushing / cleaning media is strictly forbidden.
- 5.33.4 The flushing / cleaning of systems using greenhouse effect gases (e.g. CO<sub>2</sub>, SF<sub>6</sub>) as flushing / cleaning media and discharging them to the atmosphere is strictly forbidden.

### 5.34 Food preparation

Catering services for site personnel must only be provided by competent organizations specifically qualified for such, which must provide formal evidence of being regularly audited by the statutory food hygiene services and must demonstrate of their continuous compliance with all applicable regulations.

### 5.35 Hazardous Atmospheres

- 5.35.1 Works in a hazardous atmosphere must be avoided, so far as is reasonably practicable.
- 5.35.2 If works in a hazardous atmosphere cannot be avoided, they shall be subject to a high control Permit to Work.
- 5.35.3 A ventilation plan must be designed and attached to the PTW.



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- 5.35.4 Sources of fresh air must be kept away from contamination sources such as extracted air, welding fumes, exhaust gases, etc.
- 5.35.5 Sources of fresh air must be protected from interference (i.e. open vents must be prevented from being closed or obstructed and air blowers / extractors must be safeguarded against disconnection).
- 5.35.6 Forced ventilation must be fitted with an alarm that will activate in the event of a breakdown of the ventilation system or alternatively the equipment must be doubled up, or a person must be on standby close to the equipment. In case of failure, the area with a hazardous atmosphere must be immediately evacuated.
- 5.35.7 Consideration must be given to the relative weight of the possible gases in the hazardous atmosphere, to design the appropriate ventilation plan: for instance, if the atmosphere contains heavy vapors or Carbon Dioxide, which are heavier than air, the fresh air supply must be forced to ventilate from the bottom.
- 5.35.8 Pure oxygen must never be used to improve the atmosphere, to limit the fire / explosion hazards linked with oxygen-enriched atmosphere.
- 5.35.9 Compressed gas cylinders shall not be taken into areas with hazardous atmospheres, other than those necessary for respiratory protection (e.g. escape breathing apparatus, self-contained breathing apparatus), medical resuscitation equipment, handheld aerosol spray containers and fire extinguishers.
- 5.35.10 Gases must be conveyed inside the work area by hoses of continuous length (no connections inside the hazardous atmosphere area).
- 5.35.11 When not in use, the gas supply must be turned off at the nozzle / torch and cylinders and hoses completely removed from the hazardous atmosphere area whenever it is empty of persons (including but not limited to lunch breaks, end of shift, completion of the works).
- 5.35.12 In flammable or explosive atmospheres, all electrical equipment and appliances must be explosion proof or intrinsically safe, tools must be non-spark generating and all other potential sources of ignition (Including non-intrinsically safe mobile communication devices) strictly prohibited.
- 5.35.13 Where there is a risk of fire, appropriate fire extinguishers must be kept at the entry point of the area, bearing in mind that their use may introduce additional risks (e.g. asphyxiation for CO<sub>2</sub> extinguishers).
- 5.35.14 Thermal engine driven plant / equipment such as pumps shall not be used in a hazardous atmosphere area. If unavoidable, the exhaust from engines shall be vented to a safe place away from the area and downwind of any fresh air supply intakes. Fueling of portable engine-driven equipment shall be conducted outside the area.
- 5.35.15 If hot works or works using hazardous substances (including spray-painting) are conducted in a hazardous atmosphere area, consideration must be given to the fact that the process could seriously reduce the level of oxygen and introduce flammable or toxic substances.
- 5.35.16 It is forbidden inside to store hazardous substances in the hazardous atmosphere area except for quantities immediately required for the activity.
- 5.35.17 A gas monitoring strategy adapted to the identified risk must be in place. Tests must be carried out at the necessary frequency, and always prior to entry into the potentially hazardous atmosphere.
- 5.35.18 The gas monitoring strategy must also identify whether:
- Continuous monitoring (throughout the work) is required, for instance when there is a risk that the atmosphere deteriorates suddenly;
  - Periodical monitoring is required, and if yes, how often;
  - Monitoring at the completion of the work is required.



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- 5.35.19 In all cases, the monitoring equipment must provide direct reading and penetrate far enough into the area to provide meaningful results; measurements taken at the entry point only are not acceptable.
- 5.35.20 Gas monitoring must always be performed in the following order:
1. Oxygen,
  2. Flammable substances,
  3. Toxic and harmful substances.
- 5.35.21 When monitoring levels of flammable substances, particular care must be given to set the Lower Explosive Limit of the concerned flammable substance, in order to avoid a false negative test (i.e. alarm not going-off by having set a LEL higher than which of the concerned substance).
- 5.35.22 In addition to the regular mandatory calibration of the gas detection equipment, verification of the sensor accuracy must be checked before each day's use. Exposing the instrument to a known concentration of test gas will show whether the sensors respond accurately and the instrument alarms properly. The acceptable tolerance ranges for such "bump tests" must be verified in the user's manual or with the manufacturer. Bump tests must always be carried out in the following sequence, to avoid saturation or contamination of the sensors that may lead to false readings:
1. Oxygen,
  2. Flammable substances,
  3. Toxic substances.
- 5.35.23 In case of a gas monitoring alarm, all entrants shall evacuate the workplace until a safe situation is recovered and new gas monitoring test is performed successfully.
- 5.35.24 The appropriate type of respiratory protective equipment shall be used whenever there is a risk that the atmosphere is or may become hazardous during the works, despite forced ventilation.
- 5.35.25 Filter or Cartridge-type respirators do not provide protection against oxygen-deprived atmospheres, and therefore may only be used if the air contains enough oxygen, but is contaminated otherwise.
- 5.35.26 A task-specific rescue plan, based on a risk assessment, must be prepared for all works in areas with potentially hazardous atmospheres.
- 5.35.27 The required rescue equipment must be available at the entry point of the area with potentially hazardous atmosphere prior to starting the works.
- 5.35.28 The existence, adequacy, availability and response times of emergency services, must be confirmed before starting the works.
- 5.35.29 Emergency arrangements must be periodically tested either by simulations (where practical) or other means such as audits, inspections or desktop reviews.

### 5.36 Hazardous Substances – usage

- 5.36.1 Every site shall have a substance approval process.
- 5.36.2 All hazardous substances on site must be provided with a recent MSDS (i.e. published 3 years or less before the date of access of the substance to site).
- 5.36.3 MSDS must be provided in languages that persons who are required to use or store the associated substances can understand.
- 5.36.4 Occupational Exposure Limits (OEL) must be identified for each hazardous substance used on site (source: MSDS, applicable regulation, specific sections of this document).
- 5.36.5 When various OEL are given, depending on the duration of exposure, the most relevant to the circumstances of the activity shall be used.



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- 5.36.6 Whenever various OEL apply to a specific employee (e.g. OEL mandated in the location of employment, OEL mandated in the location where the exposure takes place or OEL mandated by GE GPS), only the most stringent must be considered.
- 5.36.7 All persons are required to thoroughly wash exposed skin after exiting areas where hazardous substances are stored or used.
- 5.36.8 Whenever reasonably practicable, the following control measures shall be considered, in this order of priority:
1. Substitute the chemical with a safer alternative (e.g. change oxygen scavenger from hydrazine to carbohydrazide),
  2. Enclose the process so that any substance (including by-products such as fumes) do not escape,
  3. Use less concentrated chemicals or use a prepared mixture to avoid mixing on site,
  4. Use a form less prone to ingestion/inhalation/contact e.g. a paste rather than a powder,
  5. Change the process to emit less of the substance,
  6. Reduce the chemical quantities stored at site, employ a Just-In-Time approach,
  7. Decrease the quantity of chemicals in use (handle only what is required,)
  8. Decrease the number of employees that are exposed to the chemical (e.g. Conduct tank filling in the evening or on the weekends when less people are around),
  9. Reduce the time workers are exposed to chemicals,
  10. Select and wear appropriate PPE for the task.
- 5.36.9 For airborne particulate matter (e.g. respirable dust such as man-made mineral fiber, ceramic fiber, saw dust, etc.), the following control measures shall be considered in addition:
- Appropriate local exhaust ventilation / dust collection shall be in place;
  - Water showers, water dumping/spraying, cutting fluid or washing material before/during cutting and grinding;
  - Dilution ventilation or forced fresh air ventilation;
  - Regular and thorough housekeeping, removal of waste and excavated material.
- 5.36.10 When local exhaust ventilation is used, exhaust must not be located where it creates an additional hazard.
- 5.36.11 When dilution ventilation or forced fresh air ventilation is used, the air intake must be located far from any possible source of contamination such as fume extraction outlets, exhaust of engines, sewers, storage of chemicals, etc.
- 5.36.12 Transport of hazardous substances within the site (e.g. from the storage area to the usage area) must be done in line with the requirements outlined in 5.98.6.
- 5.36.13 All containers of hazardous substances (even temporary) must be clearly labelled with the name of the substance, its owner, and the appropriate hazard pictograms, in line with the applicable regulation and in languages that can be understood by the concerned workforce. If there is no local regulation for the labelling of chemicals, then the requirements of the "Globally Harmonized System of labelling of chemicals" must be used (see Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures).
- 5.36.14 All personnel using or exposed to harmful hazardous substances must be provided with a dedicated area where they can change clothes, storage facilities where exposed clothes are separated from clean clothes, washing facilities where the water is specifically collected and treated as hazardous waste (5.109), and wherever relevant appropriate decontamination facilities.

### 5.37 Hazardous Substances – Carcinogenic, Mutagenic or toxic to Reproduction

- 5.37.1 Every attempt must be made to avoid or substitute the use of CMR substances.



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- 5.37.2 If it is not reasonably practicable to avoid or substitute the use of CMR substances, this must be demonstrated in writing.
- 5.37.3 Areas where persons may be exposed to CMR products (or by-products) must be clearly marked with appropriate signs warning potentially exposed persons of the risk.
- 5.37.4 Exposure risks to CMR substances shall be reviewed and included in the EHS risk assessment of concerned site activities. The following information shall be clearly identified therein:
- Type and quantities and location of CMR used and stored;
  - Number of employees potentially exposed to CMR products;
  - The duration and levels of exposure to CMR, which must be determined by a competent person.
- 5.37.5 The potentially affected employees shall be informed about the risk associated to the presence of CMR products in their work area / activity.
- 5.37.6 Employees who may be exposed to CMR substances and their Supervisors shall be trained according to MSDS recommendations and risk assessment results.
- 5.37.7 In addition, specific and stringent control measures can be required by the local regulation such as, but not limited to:
- Medical surveillance for exposed workers;
  - Monitoring of exposure time and levels, etc.

### 5.38 Hazardous Substances – storage

- 5.38.1 Legal, contractual and any other applicable requirements for the storage of hazardous substances must be known on site, ensuring that any applicable license / permit are applied for and obtained in a timely manner, and that all conditions stated in such licenses / permits are met.
- 5.38.2 Storage areas or facilities for hazardous substances must be located away (at least 1.5 meters) from emergency exits, building doors, windows and air intakes and vehicle routes. Whenever those storage areas may be exposed to traffic, concrete barriers must be in place to prevent any collision with vehicles.
- 5.38.3 Legally required signage and labelling is required on all tanks, containers, vessels and receptacles. If there is no legal requirement for the signage of hazardous substances, the requirements of the GHS must apply.
- 5.38.4 Hazardous substances shall only be stored in the containers or receptacles in which they were supplied or that have been specifically designed for the purpose, and that are closed when not in use and adequately labelled. Hazardous substances must therefore not be stored in food and drink containers.
- 5.38.5 Hazardous substances shall only be stored in locked cabinets or areas.
- 5.38.6 The temperature and humidity levels in the storage area must be in line with the levels recommended in the MSDS.
- 5.38.7 Filling and decanting procedures (when applicable) shall be clearly displayed.
- 5.38.8 Storage areas for hazardous substances must be clearly identified and signs representing the main hazards and safety measures must be prominently displayed.
- 5.38.9 Emergency spill kits, suitable for the type and volume of the product, shall be immediately available at the storage area and access to them shall be maintained tidy and unencumbered at all times.
- 5.38.10 An eye wash station shall be provided in the vicinity of hazardous substance storage areas.





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- 5.38.11 When flammable substances are stored, the storage cabinets must be grounded to avoid any build-up of electrostatic charges.
- 5.38.12 When flammable substances are stored, fire extinguishers of the suitable type, size and number must be immediately available at the storage area, and at the minimum, one extinguisher with 9kg of multi-purpose dry chemical "ABC" powder must be available within 15 meters of the storage area.
- 5.38.13 Hazardous substances shall not be stored in the following locations:
- Where there is a risk of damage from impact or collision from Site traffic;
  - Within 50 meters of a spring, well or borehole;
  - Within 10 meters of a watercourse, ditch or drainage channel;
  - Where a spilt product could enter the drainage system or loose-fitting manhole covers, or soak into the ground and enter the water table;
  - On a roof;
  - In areas at risk of flooding.
- 5.38.14 Fixed position tanks (i.e. those remaining in one place for a long duration) of significant weight and volume shall be installed on an impermeable hard base such as a concrete slab with a retention bund wall with a total retention capacity of no less than 110% of the volume of the tank.
- 5.38.15 Individual storage tanks must be either double skinned, have an integral retention capability or be stored within a bunded area with a total retention capacity of no less than 110% of the volume of the tank.
- 5.38.16 Storage areas of multiple tanks and containers shall have a total secondary containment or retention capacity of no less than 110% of the volume of largest container or 25% of the total volume of the containers, whichever is the largest figure.
- 5.38.17 Spillages and leakages must be cleaned without delay and treated as hazardous waste (see 5.104, 5.105, 5.106, 5.108).
- 5.38.18 Secondary containment must be emptied of water regularly, to avoid overfilling which may lead to ground contamination in case of spillage or leakage of hazardous substances.
- 5.38.19 Intermediate Bulk Containers without integral retention capability shall be stored within a secondary containment/retention area of suitable capacity (according to points above).
- 5.38.20 When not in use all hoses connections and nozzles must be stored within the secondary containment or retention area.
- 5.38.21 These conditions shall apply to permanent, temporary and transportable / mobile storage facilities.
- 5.38.22 Incompatible chemicals must be stored so that they do not come into physical contact with one another (e.g. flammables and oxidizers, acids and caustics).
- Acids must be segregated from alkalis for storage;
  - Acids must be segregated from organics for storage;
  - Alkalis must be segregated from organics for storage.
- 
- In addition, the Table 1: Storage incompatibilities for hazardous substances shall be considered (if a substance has more than 1 pictogram describing it, the acceptable storage conditions must be the most stringent of all those applicable).
- 5.38.23 Permanent and temporary piping at the site shall have their contents, direction of the fluid, pressure and temperature identified by color-coding and signs, in line with all local regulations.



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Table 1: Storage incompatibilities for hazardous substances

Substance B Substance A	Flammable	Compressed Gas	Oxidizer	Toxic	Harmful / Irritant	Corrosive	Environmentally damaging	Explosive
Flammable	Segregate gases from liquids/solids	Segregate	Segregate (fire wall or 5 m)	Segregate A from B	Check MSDS for particular requirements	Segregate (do not store B above A)	Segregate	Segregate (fire wall or 5 m)
Compressed Gas		Check MSDS for particular requirements	Check MSDS for particular requirements	Segregate from liquids/solids	Segregate from liquids/solids	Segregate (do not store above A)	Segregate from liquids/solids	Segregate (fire wall or 5 m)
Oxidizer			Check MSDS for particular requirements	OK	OK	Check MSDS for particular requirements	OK	Segregate (fire wall or 5 m)
Toxic				Check MSDS for particular requirements	OK	Segregate (do not store B above A)	OK	Check MSDS for particular requirements
Harmful / Irritant					OK	Segregate (do not store B above A)	OK	Check MSDS for particular requirements
Corrosive						Segregate (do not store above each other)	Segregate (do not store A above B)	Segregate (do not store A above B)
Environmentally damaging							OK	OK
Explosive								Segregate (fire wall or 5 m)

**NOTES:**

Particular care must be given to the compatibility of storage of:

- Gases (hazardous or not) with hazardous liquids and solids (projections in case of gas leak)
- Oxidizing and flammable substances
- Substances flammable when in contact with water and substances containing water
- Substances flammable when in contact with air and compressed air cylinders

Organic peroxides (type of oxidizers, transport hazardous category 5.2) must be strictly isolated from any other hazardous substance, **at all times**

Source; 'Chemical warehousing: The storage of packaged dangerous substances', HSG71, published in 2009 by Health and Safety Executive (HSE). ISBN: 9780717662371

**5.39 Hazardous substances – list of controlled substances**

The following table establishes the list of substances restricted for use in GE GPS, and the scope of such restrictions.

Table 2: List of prohibited substances

Substance name	Scope of restriction
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Substance name	Scope of restriction
Asbestos	Asbestos-containing materials must not be present in packaging materials, transportation means, parts, components, materials or products designed, sourced, manufactured or sold by GE.
Brominated Flame Retardants	Packaging materials must not contain flame-retardants that are polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs), also known as polybrominated biphenyl ethers (PBDEs) and polybrominated biphenyl oxides (PBBOs), including Decabromobiphenyl Ether (DecaBDE), in concentrations greater than or equal to 0.1% (1000 PPM) by weight in any homogeneous material.
Cadmium, Hexavalent Chromium, Lead, Mercury and their compounds	Packaging materials must not contain lead, mercury, cadmium, or hexavalent chromium where the sum concentration of incidental lead, mercury, cadmium, and hexavalent chromium is greater than 0.01% (100 PPM) by weight.
Chlorinated Hydrocarbons	Chlorinated hydrocarbons must not be contained in any parts, components, materials or products designed, sourced, manufactured or sold by GE in concentrations greater than or equal to 0.1% (1000 PPM) by weight in any homogeneous material.
Chlorinated Paraffins	Short Chain Chlorinated Paraffins (SCCPs) including, but not limited to, those identified by CAS numbers 63449-39-8 and 85535-84-8, must not be used or contained: <ul style="list-style-type: none"> <li>- in softeners in paints, coatings and sealants;</li> <li>- in oils;</li> <li>- in flame-retardants in rubber, plastic and textiles,</li> </ul> designed, sourced, manufactured or sold by GE, in concentrations greater than or equal to 0.1% (1000 PPM) by weight in any homogeneous material.
Formaldehyde	Formaldehyde must not be used in wooden materials, furniture, detergents, cleaning agents and polishes designed, sourced, manufactured or sold by GE in concentrations greater than or equal to 0.0005% (5 PPM) by weight in any homogeneous material.
Halogenated Diphenyl Methanes	Halogenated diphenyl methanes must not be present in any parts, components, materials, or products designed, sourced, manufactured or sold by GE in concentrations greater than or equal to 0.1% (1000 PPM) by weight in any homogeneous material.
Lead in Paint	Lead carbonates and sulphates must not be used in any paint applied to parts, components, materials, or products designed, sourced, manufactured or sold by GE in concentrations greater than 0.01% (100 PPM) by weight in any homogeneous material.
Ozone Depleting Substances (ODS) except CFCs and HCFCs	Ozone Depleting Substances must not be used in the manufacturing process of any parts, components, materials or products manufactured by GE.
Chlorofluorocarbons (CFCs)	CFCs must not be present in packaging materials, transportation means, parts, components, materials or products that are designed, purchased, manufactured or sold by GE, including refrigeration and cooling units.
Hydrochlorofluorocarbons (HCFCs)	Hydrochlorofluorocarbons (HCFCs) must not be used in plastic foam packaging materials (e.g. foaming agents) designed, sourced, manufactured or sold by GE.
Polychlorinated Biphenyls (PCBs) and Polychlorinated Terphenyls (PCTs)	Polychlorinated biphenyls (PCBs) and polychlorinated terphenyls (PCTs) must not be present in parts, components, materials, or products designed, sourced, manufactured or sold by GE.
Polychlorinated Naphthalenes	Polychlorinated Naphthalenes (more than 3 chlorine atoms) must not be present in parts, components, materials, or products designed, sourced, manufactured or sold by GE in concentrations greater than or equal to 0.0005% (5 PPM) by weight in any homogeneous material.
Radioactive Substances	Radioactive substances must not be present in any equipment or material designed, sourced, manufactured or sold by GE, unless when used for their radioactive properties such as for non-destructive testing.
Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)	TBTs, TPTs, and TBTOs must not be used in parts, components, materials or products designed, sourced, manufactured or sold by GE in concentrations greater than or equal to 0.0005% (5 PPM) by weight in any homogeneous material.

**5.40 Hot works**

- 5.40.1 Conduct a risk assessment for designated tasks and areas where routine hot work operations are expected to be performed.
- 5.40.2 So far as is reasonably practicable, there shall be no hot works performed within 10 meters of explosive or flammable substances and of areas with a potentially explosive atmosphere.





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- 5.40.3 Hot works adjacent to any cavity wall structure where there is no visibility of internal surfaces must be avoided, so far as is reasonably practicable.
- 5.40.4 Hot works on or under roof or gutters shall be avoided so far as is reasonably practicable, due to the risk of accumulation of dust and debris that could catch fire. Cold working options should be employed wherever possible.
- 5.40.5 Where the risk assessment confirms it is necessary, a hot work permit should be used.
- 5.40.6 Whenever the requirements of 2, 3 and 4 cannot reasonably be implemented, and in addition to any other control measures (e.g. Permit to Work), a fire watch must be provided and maintained for 1 hour after the work has been completed. This fire watch shall consist of 1 or more persons, competent and trained in detecting and extinguishing fires, surveying the area to detect, tackle and report any fire that could start as a result of the hot works.
- 5.40.7 Appropriate steps must be taken to avoid hot working methods when installing, repairing or replacing flat roof coverings, so far as is reasonably practicable. Cold curing adhesives shall always be considered in preference to gas-torch roofing.
- 5.40.8 Only dedicated torch strikers shall be used to ignite gas-torches. It is strictly forbidden to use lighters, matches, or existing hot work to do so.
- 5.40.9 A suitable fire extinguisher shall be available at each location where hot works are undertaken, and within 2 meters of the activity.
- 5.40.10 Falling and flying sparks shall be contained and equipment protected by the use of fire resistant screens and/or mats.
- 5.40.11 Protective screens shall be installed to prevent welding flash injuries to other persons.
- 5.40.12 Mobile fuel gas supply facilities shall be set up at the workplace or as near to it as practicable, and should where possible be in the employee's field of vision, without creating any supplementary risks.
- 5.40.13 Gas cylinders and welding equipment must be accompanied by conformity and certification documents and/or labels.
- 5.40.14 Flammable gas supply facilities must be safeguarded against flashback at the main cylinder valve and the valve at the point of work.
- 5.40.15 All gas cylinders, full or empty, shall be secured in the upright position without risk of falling over.
- 5.40.16 Empty gas cylinders shall be removed from the work area as soon as practicable.
- 5.40.17 Transport of gas cylinders must be done in line with the requirements of section 5.98.6.

### 5.41 Housekeeping

- 5.41.1 Each organization is responsible for the housekeeping in its work areas, which includes work zones, lay-down and storage areas, site facilities and office areas.
- 5.41.2 Safe, clean, dry, unencumbered access to and from the work areas shall be ensured at all times.
- 5.41.3 All areas (including offices and rest areas) shall be safe, clean, dry, tidy and well organized and provide protection for the environment.
- 5.41.4 Whenever wet processes are used as part of normal working operations or during cleaning operations, appropriate drainage must be in place with associated platforms, mats or other dry places for persons to stand, so far as is reasonably practicable. When this is not reasonably practicable, signs must be implemented at all access points to the wet area, which should clearly highlight the hazard of wet and slippery surface in appropriate languages so to be understood by all concerned personnel.



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- 5.41.5 Access to emergency equipment and emergency exits must never be blocked or otherwise disturbed, restricted or delayed.
- 5.41.6 Sufficient numbers of suitable bins and/or containers shall be provided for the separation, recycling, treatment and disposal of waste (see 2, 3, 4, 6).
- 5.41.7 Waste, rubbish, packing material and surplus building material shall not be allowed to accumulate and shall be systematically removed from the work area and disposed of appropriately.
- 5.41.8 Material laydown and storage areas shall be well organized, clearly and permanently identified and shall not create supplementary hazards to persons.
- 5.41.9 All hazardous materials shall be stored, handled, used and disposed of in accordance with the requirements of 5.36, 5.38 and of the Site-specific EHS Plan;
- 5.41.10 At the completion of works and before demobilization, all work areas shall be left clean and free of any waste, rubbish or surplus building materials.
- 5.41.11 Particular care must be given to workplaces at height, where there is a risk of falling objects. These areas must be kept free of any loose material resting on the floor that could fall and injure persons or damage property.
- 5.41.12 Outdoor walkways, work places and vehicle routes must be kept clear of the accumulation of snow and ice that could cause any hazard to pedestrians or vehicles, so far as is reasonably practicable.
- 5.41.13 Electrical cables/cords, compressed gas and hydraulic hoses shall not be laid over roads or walkways. If not reasonably practicable, they shall be protected against damage by a sustainable means above or below ground, or safely suspended at height.

### 5.42 Industrial Hygiene

- 5.42.1 All EHS Risks and Impacts Analyses must be completed by a competent person and consider the potential exposure of persons to chemical, biological and physical agents (including process by-products) that could harm their health.
- 5.42.2 When assessing health risks, the EHS Risks and Impacts Analyses must consider, in particular:
  - The hazardous properties of the agent and its potential health effect(s);
  - How the hazard arises (produced or given off by a process, activity or as a result of an accident, incident or work practice, etc.) and the physical form of the substance (powder, vapor, dust, etc.);
  - The level, type and duration of exposure, defining potential acute and/or chronic exposure;
  - The foreseeable entry way of the agent into the human body (i.e. ingestion, inhalation, direct contact, indirect contact – for radiation);
  - The relevant circumstances of the work, including the amount of the substance involved;
  - Any relevant workplace exposure limit or similar occupational exposure limit;
  - The results of exposure monitoring, when available;
  - The results of relevant medical surveillance, when available;
  - In circumstances where the work involves exposure to more than one hazard to health, the risk presented by exposure to such substances or physical agents in combination.
- 5.42.3 Risk reduction measures and specific exposure limits (when existing) are given for the following agents in dedicated sections of this document:
  - Chemical Agents:
    - o Asbestos (see 5.5);



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- Cement and Lime-based substances (see 5.6);
  - Hexavalent Chromium
  - Lead (see 5.47)
- Biological agents:
  - Legionella (see 5.13);
  - Pest / vermin (see 5.61 and 5.62);
  - Contaminated waste (see 5.103, 5.105, 5.106);
  - Biological contaminants, bloodborne pathogens and other pathogens borne in body fluids (see 5.57);
- Physical agents:
  - Noise (see 5.58 and 5.59);
  - Temperature Extremes (see 5.122 and 5.124);
  - Vibration (see 5.100 and 5.101);
  - Work in hyperbaric conditions (see 5.3);
  - Ionizing radiation (see 5.81);
  - Non-ionizing radiation (see 5.82);
  - Electromagnetic fields (see 5.83);
  - Dust (5.15).

5.42.4 In addition to the above, the risk control measures described in 5.36 must be implemented.

5.42.5 As a general and overarching principle, whenever it is suspected that exposure levels are close to, equal or greater than the applicable OEL, quantitative monitoring must be implemented in accordance with the recommended method and / or best industrial practice.

5.42.6 Whenever quantitative monitoring confirms that the exposure levels are equal to or greater than the OEL, immediate measures must be implemented to reduce the exposure levels, in accordance with the following hierarchy:

1. Eliminate the process generating the exposure, or the harmful agent (e.g. use Phased-Array Ultrasound Testing instead of gamma radiography);
2. Substitute the harmful agent by a less harmful agent (e.g. use diluted substances);
3. Implement engineering / technical measures to reduce the likelihood, duration, or severity of exposure (e.g. use of silencers for steam blow, exclusion zone);
4. Implement administrative measures to reduce the likelihood, duration, or severity of exposure, or the number of persons exposed (e.g. Permit to Work);
5. Ensure that all exposed persons use appropriate Personal Protective Equipment.

5.42.7 If welding is conducted on Zinc bases, metals or coatings, or stainless steel, a suitable fume extraction system shall be in operation, so far as is reasonably practicable. In addition, all persons potentially exposed to such welding fumes shall wear the appropriate filter-type respirators.

### 5.43 Interference with moving vehicles and pedestrians

5.43.1 The circulation of vehicles and pedestrians must be segregated by establishing restricted areas, one-way routes where possible, pedestrian crossing zones and designated parking areas.

5.43.2 The appropriate measures must be implemented to prevent collision between pedestrians and vehicles at pedestrian crossings. This may include, but shall not be limited to:

- Mirrors;
- Lighting;
- Speed bumps before the crossing point.

5.43.3 Vehicle and pedestrian ways shall be physically separated with Hard-barriers, so far as is reasonably practicable, and be indicated with signs.

5.43.4 When it is not reasonably practical to implement a physical segregation, pedestrians must maintain a safety distance of at least 2 meters from moving/operating vehicles at all times.



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- 5.43.5 Traffic rules must be made visible through signage and traffic stops, consistent with those used on public roads of the concerned country.
- 5.43.6 All pedestrians on Project sites must wear high-visibility garments.
- 5.43.7 Pedestrians (including banksmen) must wear high-visibility garments in all areas where trucks and other vehicles (forklifts, cranes, etc.) maneuver. These areas must be clearly signaled / marked (floor painting, Hard-barriers, signs, etc.).
- 5.43.8 Competent banksmen must be used for operations involving reversing or maneuvering where space or view is restricted.
- 5.43.9 Drivers must only operate vehicles they are competent to drive.
- 5.43.10 Drivers must follow the established traffic routes and comply with all site rules.
- 5.43.11 The maximum driving speed on Site is 20km/h at the site entrance and around temporary facilities and 10km/h within the construction site.
- 5.43.12 The carrying of passengers on vehicles not designed for this purpose, or exceeding the rated capacity is forbidden.
- 5.43.13 Drivers and passengers must not get on or off moving vehicles.
- 5.43.14 When driving a forklift, forks must be lowered and the mast tilted back.
- 5.43.15 Smoking, eating, drinking (including from a water bottle or container), using a mobile phone, or using earbuds or headphones when driving a vehicle is strictly prohibited.
- 5.43.16 When hitching or unhitching a trailer, safety procedures must be defined and fulfilled to ensure there is a clear form of communication between operators and hitchers.
- 5.43.17 When the vehicle is not in use, it must be ensured that:
  - The engine is stopped and prevented from unauthorized use (e.g.: starter key removed), brake applied (and with wheels chocked for heavy vehicles);
  - All raised parts are lowered to the ground or put in a safe position (cranes);
  - It does not obstruct emergency exits, other routes, fire equipment or electricity panels.
- 5.43.18 It is strictly forbidden to use 2 or 3-wheeled motorized vehicles on any GE GPS site.

### 5.44 Ladders - general requirements

Ladders are a means of access between two different elevations only and are not generally considered to be a work station, and may only be used strictly adhering to the following requirements.

- 5.44.1 Only one person shall climb a ladder at any one time.
- 5.44.2 When climbing or descending a ladder, persons shall maintain at least 3 points of contact at all times. Both hands must be kept free for holding onto the ladder.
- 5.44.3 Ladders shall extend a minimum of one (1) meter beyond the top of the step-off point.
- 5.44.4 Ladders shall be maintained free of oil, grease and other slipping hazards.
- 5.44.5 For access ladders higher than 3 meters, individual (vertical lifeline with fall arrest equipment) protection shall be used.
- 5.44.6 Whenever an access is to be created for a significant number of users, stairways shall be preferred to ladder as far as reasonably practicable.

### 5.45 Ladders - portable ladders

- 5.45.1 Portable ladders shall be of professional purpose-built construction and conform to European Class 1 standard for portable ladders, or acceptable equivalent.



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- 5.45.2 Conductive or metal portable ladders shall be prominently marked as conductive and not be used near energized lines or equipment. Ladders used in an electrical environment should be of fiberglass construction.
- 5.45.3 Portable ladders shall be inspected before each use and in case of deformity, damage or missing parts be removed immediately from use.
- 5.45.4 The use of self-fabricated ladders is strictly prohibited.
- 5.45.5 Step-ladders must be used in the open and secure position.
- 5.45.6 Portable ladders must not be placed in such a position that any material or equipment would interfere with their safe use.
- 5.45.7 Portable ladders must be laid on stable ground, and secured to prevent slipping outwards and sideways (or secured by another person).
- 5.45.8 Portable ladders shall be set at an angle of approximately 75°, secured at the top and base, in such a way to prevent shifting, slipping, rotating, being knocked or blown over, without impeding the ascent or descent.
- 5.45.9 Portable ladders shall be tied to a suitable anchor point, using top, bottom and intermediate fastenings as necessary to hold them rigidly in place.
- 5.45.10 The maximum length of an extended portable ladder shall not be more than six (6) meters.
- 5.45.11 Portable ladders may only be used as a temporary workstation for non-repetitive tasks of short duration at a maximum height of three (3) meters.
- 5.45.12 Portable ladders must be lowered and stored at the end of each workday.
- 5.45.13 Portable ladders must be inspected every day before being used.

### 5.46 Ladders - fixed / permanent / vertical ladders

- 5.46.1 Vertical ladders shall be designed in accordance with ISO 14122-4 and as such:
  - When over 10 m high, must have a platform at least every 6 m and be offset at least 0.7 m at every platform;
  - Have a fall protection device when over 3 m;
  - Have a safe live line over 3 m.

### 5.47 Lead – Occupational Exposure Limits

- 5.47.1 In the absence of local regulations, or where local regulations are less stringent, the following shall be considered as the occupational exposure limits to be applied on all GE GPS sites: 50 micrograms of lead per cubic meter of air (50 µg/m<sup>3</sup>) average exposure over a duration of 8 hours.
- 5.47.2 Additional or more stringent limits may apply locally, and may depend on the method of analysis (e.g. paint chip sampling, wipe sampling). These limits must be identified and strictly adhered to.
- 5.47.3 Where lead has been discovered on site, all measures shall be taken to avoid contact with it. If the presence of lead-containing material is suspected, the following actions should be taken whilst observing local legislation:
  - Vacate and cordon-off the area until tests are performed;
  - Request inspection and tests by an organization specifically qualified for such.
- 5.47.4 Where it has been determined by competent personnel that lead is present on site, a plan to prevent exposure of persons to concentrations that approach or exceed the limits defined in 5.47.1 and 5.47.2 must be designed by the competent personnel and formally accepted by the



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GE GPS EHS Leader. Measures may include but shall not be limited to those described in 5.36 and 5.37.

5.47.5 Where the decision is taken to leave the lead-containing material in place, all means must be employed to prevent any deterioration of it.

5.47.6 Where the decision is taken to remove the material containing lead then competent and authorized personnel must do this.

### 5.48 Lifting accessories

5.48.1 When not in use, rigging equipment shall be removed from the immediate work area and properly stored and maintained in a safe condition.

5.48.2 The Safe Working Load must be labelled on every lifting accessory.

5.48.3 Lifting accessories must never be overloaded. An exception may only be granted when an authorized competent person is testing the lifting accessory.

5.48.4 Sufficient protection (e.g. rubber pads) shall be installed on edges and corners of the load to prevent damage to lifting accessories.

5.48.5 Any observed damaged lifting accessory shall be immediately removed from the workplace, returned to the quarantine storage where it shall be either destroyed or repaired and re-inspected.

5.48.6 All hooks used for lifting must be fitted with a spring-loaded safety catch.

5.48.7 "C-hooks" use is forbidden.

5.48.8 Hooks shall be removed from service if twisted 10 or more degrees, if their opening is deformed from 15% or more, or if they are damaged in any way.

5.48.9 Slings must be attached correctly to the lifting equipment either by passing the sling directly into the hook (the sling shall lay in the base of the hook) or using a bow-shackle, fitted with the pin of the shackle on the hook and the slings attached to the bow of the shackle.

5.48.10 Multiple slings (two-legged, three-legged, etc.) must be attached together by a ring or a shackle and the load properly distributed so that no leg is overloaded.

5.48.11 The angles between sling legs must be considered in calculations, as the Safe Working Load of the sling assembly decreases when the angle between slings increases.

5.48.12 Chain slings shall only be shortened by using the correct shortening clutches.

5.48.13 Chains must not be knotted or joined by nuts and bolts.

5.48.14 Wire ropes shall never be used if:

- 5 or more wires are broken in a strand in a lay length, or;
- 10 or more wires are broken anywhere in a lay length, or;
- it is "bird-caged" or kinked, or;
- it has excessive corrosion, or;
- An electric current flow has passed through the rope.

5.48.15 Single lengths of wire rope shall not be used to create custom-made "endless slings" (where an end of a rope is attached to the other end to create a loop) directly on site, so far as is reasonably practicable, and in any case never to lift persons (e.g. man-baskets, working platforms, gondola scaffolds).

5.48.16 If "endless slings" are made from wire rope directly on site, the following requirements must be applied:

- Preferably, the two terminations of the wire rope shall be attached together with interlocking turnback eyes, protected with thimbles. See Figure 6.





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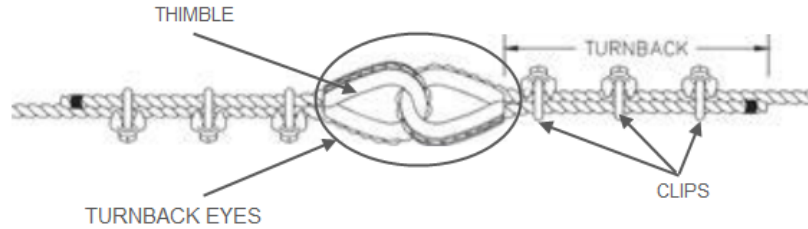


Figure 6: Wire rope ends attached with turnback eyes, with thimbles

- Alternatively, the 2 ends of the wire rope can be attached together using twice as many clips as used for a "standard" termination. The 2 ends shall be placed parallel to each other and overlapping by twice the turnback amount as used for a standard termination. The minimum number of clips shall be installed on each "dead" end. See Figure 7.

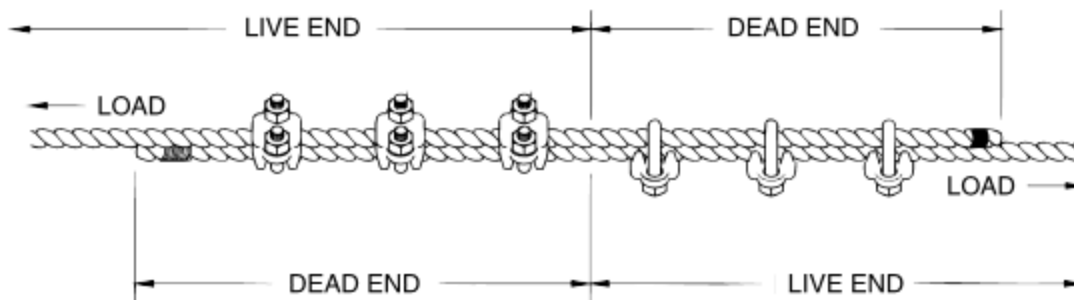


Figure 7: Wire rope ends attached with a double turnback termination

- The appropriate method must be used to attach securely the ends of the wire rope together (e.g. clamps/clips, ferrules, etc.). When clips are used, the minimum number used must be 2, and they must always be installed with their saddle on the load-bearing (live) side of the wire rope.

5.48.17 Particular care shall be given to the use of Dynamo eyebolts (where the eye is not forged into the collar), as they are not able to withstand any load applied on the side of their eye. Collared eyebolts shall be used whenever the lifting accessories are applied at an angle from the eyebolt's screw, and therefore shall be the preferred type of eyebolt to screw into or through a load. Recommendation: Use of **swivel lifting eyebolts** (articulated) should be used. Indeed, this kind of lifting eyebolts is able to tip over 180° and to rotate 360°. For that matter, it is **recommended** to use it **when tipping over a load**





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Figure 8: Collared eyebolt. Picture by ARIFSA Representaciones, SCP, CC BY-SA 3.0

5.48.18 It is strictly forbidden to use folded eyebolts as lifting points.

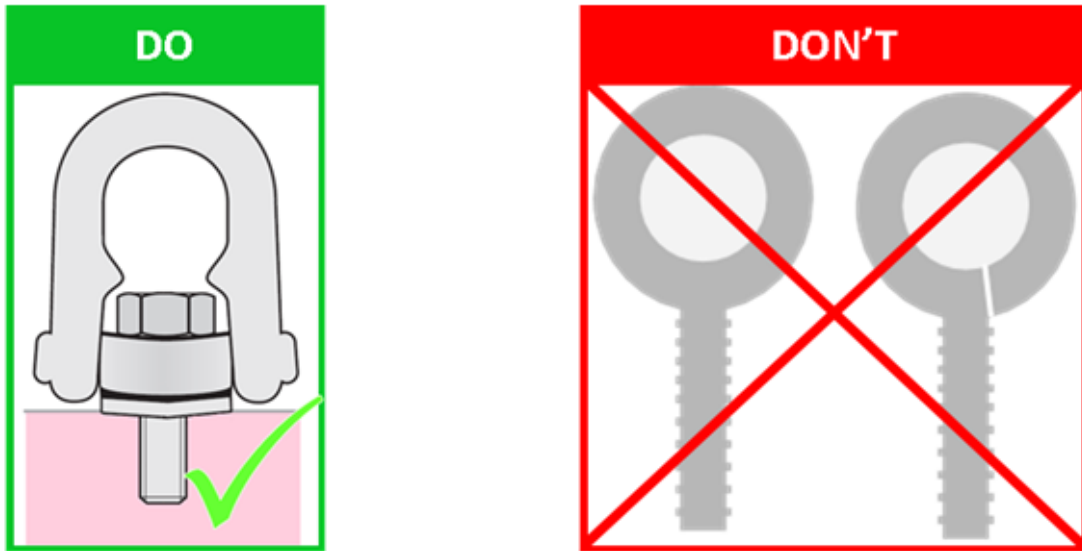


Figure 9: folded eyebolt DO/Don't

5.48.19 All lifting equipment and accessories must be uniquely identified, marked with the safe working load, and subject to thorough examination by a competent person at intervals not exceeding:

- Six months for lifting accessories and equipment used to lift persons
- Twelve months for other lifting equipment.
- A shorter duration may be defined for specific equipment or accessories, when the risk assessment identifies it is necessary.

5.48.20 All lifting equipment and accessories must have a valid manufacturer's certificate or thorough examination records

5.48.21 Gloves preventing the risk of abrasion and cuts must be used to handle lifting accessories.

5.48.22 Custom made lifting accessories may only be used if they have been designed by a competent person, formally certified by a competent recognized third party as safe for their designed use, upon examination and testing, and provided with all relevant documentation, as required by the Site-Specific EHS Plan. In case such designs, certificates or any other documentation are not available, the lifting accessory must not be used and quarantined.

### 5.49 Lifting operations – lift plans

5.49.1 Every lifting operation shall be covered by either a lift plan or risk assessment, prepared, checked and issued by competent authorized persons and providing a sufficient level of details on load(s) characteristics, lifting equipment and accessories being used, lifting and rigging methods and staffing of lifting crew. Routine lifts may be managed by a risk assessment.

5.49.2 Any lift that meets one of the following criteria must be managed with a lift plan:

- Lifts using 2 cranes.
- Lifting loads that are more than 75% of the crane capacity.
- Lifts outdoors that may act as a sail in windy conditions, i.e. weight of >1 ton per m2.





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- Lifting or personnel in man baskets.
- Crane operations close to overhead power lines.

### 5.49.3 As a minimum, Lifting Plans must include:

- The reference to the task-based EHS Risks and Impacts Analysis;
- The step-by-step lifting sequence and method;
- The list of all persons undertaking any roles in the Lifting Operation, with the description of their roles and responsibilities and their proof of competency;
- The intended communication method between the Crane Operator and Signalmen;
- The identification of the lifting zone and the control measures to prevent access to it;
- Consideration for simultaneous operations and the measures taken to avoid conflicting tasks in the lifting zone;
- The description of the load including but not limited to its type, weight, size, shape, location of center of gravity, type of packaging, special conditions (fragile, hazardous substances, etc.), etc.;
- The method used for slinging, attaching and detaching the load, as well as the location and characteristics of the lifting points on load (safe working load per point, allowed lifting angles, etc.);
- The list and characteristics of the lifting accessories to be used;
- The calculation of the total weight to be lifted (i.e. load + lifting accessories);
- The identification and description of the Lifting Equipment, including its Safe Working Load;
- Location of the Lifting Equipment, load-bearing of the ground and appropriate methods to secure the crane and spread the load;
- The proximity of hazards and obstructions to the movement of the crane (e.g. overhead power lines);
- The identification and description of the landing area, including but not limited to: dimensions and load bearing;
- Any necessary calculations as required.

### 5.50 Lifting operations – equipment

- 5.50.1 When several lifting equipment may operate in their mutual area of operation, there must be engineering measures implemented, to prevent any collisions. These may include (but are not limited to): stop blocks on the crane rail, electronic / software limitations and proximity warnings and trip devices operated by light curtains. Additional measures may be implemented such as coordination of lifting operations and Permit to Work.
- 5.50.2 All cranes and derricks shall be equipped with Anti two-blocking device (A2B)/Hoist-limit device to stop the load hoisting function before the load block or load contacts the boom tip and to prevent damage to the hoist rope or other machine components when extending the boom.
- 5.50.3 Lifting equipment must be marked with their Safe Working Load for each hook.
- 5.50.4 Cranes must be equipped with a summary of all safety precautions for use that shall be directly available to the crane operator, so far as is reasonably practicable. This summary shall include but be not limited to:
- A diagram of maximum loads allowable (load chart) depending on the boom angle and/or its extension for mobile cranes, and distance of the trolley on the jib for tower cranes,
  - A diagram of the control panel.



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- 5.50.5 Cranes must be fitted with a boom angle indicator, boom extension length indicator and trolley distance on the jib indicator whenever relevant. These indicators must be readable by the crane operator at all times while operating the lifting equipment.
- 5.50.6 Cranes must be fitted with a wind meter at the top of the crane boom or jib, whichever is the highest.
- 5.50.7 Lifting equipment must be fitted with brakes on the hoisting mechanism that engage automatically in case the lifting equipment is not powered.
- 5.50.8 Cranes may require to be fitted with aviation warning lights, in compliance with the local regulation.
- 5.50.9 Custom made lifting equipment may only be used if it has been designed by a competent person, formally certified by a competent and recognized third party as safe for use upon examination and testing, and provided with all relevant documentation as required by the Site-Specific EHS Plan.

#### 5.51 Lifting operations – preparing and conducting the lift

- 5.51.1 A clearance distance of at least 1-meter width must be maintained between any moving part of a lifting equipment and any fixed object (e.g. guardrail, building), so far as is reasonably practicable. When this is not possible, access to any place where a person might be trapped between the moving lifting equipment and a fixed object must be prevented with Hard-barriers.
- 5.51.2 The stability and load-bearing capacity of the ground must be sufficient to carry the maximum static and dynamic loads, considering slewing torques, wind stresses and shock loading, as well as the weight of the crane and its load.
- 5.51.3 Soft ground must be levelled, ballasted, and compacted to ensure it provides the sufficient load bearing capacity to withstand the weight of the crane and loads.
- 5.51.4 Unless the crane itself and the lifting operation are designed for “pick and carry”, outriggers must be used for all lifting operations, they must be extended fully on both sides of the lifting equipment and laid on steel plates of sufficient thickness and surface area to spread the load.
- 5.51.5 No lifting operation shall be undertaken whenever the wind speed at the location of the lifting or at the maximum height of the crane jib exceeds 20 meters per second for tower cranes, or 14 meters per second for mobile cranes and gantry cranes or when loads with a significant surface are lifted with tower cranes.
- 5.51.6 Two or more separately rigged loads shall not be hoisted in one lift.
- 5.51.7 Riggers shall attach lifting accessories to the load in strict compliance with the requirements of the Lifting Plan.
- 5.51.8 Banding or strapping shall not be used as rigging to hoist loads of bundled materials.
- 5.51.9 The hook latch must be closed and secured prior to and throughout the lifting operation.



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Figure 10: crane hook with a safety latch closed. Picture by tanakawho, CC BY 2.0

- 5.51.10 Prior to any lifting operation, the crane operator and/or lifting supervisor must ensure that all persons affected by the operation have been warned of the operation commencing and that the area under the foreseen lifting path is clear of unauthorized personnel.
- 5.51.11 Only one competent banksman shall provide signals to the crane operator.
- 5.51.12 The banksman shall be clearly identifiable, for example by a different colored vest or helmet.
- 5.51.13 Direct verbal and/or standard international hand signals and/or radio communication between the crane operator and banksman shall be used.
- 5.51.14 The crane operator shall not engage in any activity that may divert their attention while operating the lifting equipment.
- 5.51.15 The crane operator must obey any instructions to abort or stop the operation, regardless of who gives the instruction.
- 5.51.16 The crane operator shall not leave the crane during the lifting operation, and there shall be no suspended load when the crane operator is not at the controls of the crane.
- 5.51.17 Areas where loads, lifting accessories or lifting equipment may fall shall be considered as hazardous and as such shall be delimited by appropriate visual and physical means:
- Chains, warning tape and warning signs for one-off or single lift, and/or;
  - Hard-barriers and warning signs for multiple lifts in the same zone, and/or;
  - Watchperson/s at the lifting zone boundary, where a common or regular access way is blocked due to the lifting or is otherwise reasonably required.
- 5.51.18 Loose items must be lifted in closed boxes or containers whenever reasonably practicable, or otherwise securely fastened onto pallets before lifting.
- 5.51.19 Non-vertical pulling of loads, swinging loads into position and drawing vehicle with lifting equipment is strictly prohibited.
- 5.51.20 Crane booms must not be worked at a radius greater than specified by the manufacturer and certified by a competent 3<sup>rd</sup> party.
- 5.51.21 The Safe Working Load of the lifting equipment at the relevant angle and radius of the boom must never be exceeded, except when the equipment is being tested by a competent person.



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- 5.51.22 No person shall be positioned under any suspended load at any time, or between a suspended load or element of the lifting equipment and fixed object, where a risk of being crushed exists. This includes operations where persons in the baskets of MEWPs may be crushed.
- 5.51.23 Wherever practicable and when their use does not create a hazard, tag-lines shall be used to guide loads in place (see Figure 11), and shall not be wrapped around any part of the body.



Figure 11: workers using tag-lines to guide the load during a lifting operation

- 5.51.24 Whenever operating near to an overhead power line, the requirements of 5.60 shall apply.

In addition:

- All ground personnel must keep clear of the crane and load at all times;
- Tag-lines must not be used, instead insulated poles ("hot sticks") must be used to guide the load;
- The crane shall be grounded;
- The load, lifting accessories and lifting equipment shall be wired together to ensure the transfer of any induced voltage to the ground.

### 5.52 Power line clearance – equipment operations (all voltages)

- 5.52.1 Identify the work zone for the lifting equipment in question (work zone is the area 360 degrees around the crane, up to the lifting equipment's maximum working radius). A determination shall be made if any part of the lifting equipment, load line or load (to include rigging and lifting accessories), if operated up to the lifting equipment/crane's maximum working radius in the work zone, could get within the electrical working clearance distance (as per 5.18.7) of the power line, one of the following must be met: -
- a. De-energize and ground. Confirm from the utility owner/operator that the power line has been de-energized and visibly grounded at the worksite.
  - b. Ensure no part of the LHE, load line or load gets closer than electrical working clearance distance (as per 5.18.7) to the power line by implementing the following:



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- Conduct a planning meeting with the site/lift supervisor, signal person/rigger, operator, crew and the other workers who will be in the area. Review location of the power lines and the control measures to prevent encroachment or electrocution.
- If tag lines are used, they must be non-conductive;
- Erect and maintain an elevated warning line, barricade or line of signs in view of the operator, equipped with flags or similar high-visibility markings, electrical working clearance distance (as per 5.18.7) from the power line.
- In addition, at least one of the following must be in place:
- Use of a dedicated spotter who is in continuous contact with the operator. The spotter must have a visual aid to assist in identifying the minimum clearance distance (e.g., clearly visible line painted on the ground). The spotter must be positioned to effectively gauge the clearance distance;
- A proximity alarm set to give operator sufficient warning;
- A device that automatically limits range of movement, set to prevent encroachment.
- An insulating link/device installed at a point between the end of the load line (or below) and the load.

### 5.53 Lighting of the workplace

- 5.53.1 All workplaces (i.e. excluding access ways and vehicle routes) must be sufficiently lit, in such a way that lighting levels are equal to or greater than 50 lux at any point of the workplace.
- 5.53.2 Areas where persons may be present and where there is no or low natural light (i.e. where the lighting levels may be lower than 50 lux) must be provided by an appropriate and operational emergency lighting that indicates safe evacuation ways.

### 5.54 Lone working

Lone workers are those who work alone without close or direct supervision, thereby being unable to raise the alarm in the event of them being injured, trapped, etc.

- 5.54.1 Lone working shall be avoided, so far as is reasonably practicable. Lone working, if any, shall be identified in risk assessments and control measures shall be defined.
- 5.54.2 Working on or near live electrical conductors, tasks involving high voltage electrical work, or arc flash risk, work in any confined space (5.359), works near or over water (5.1.1), works in particularly hot temperatures (5.122), or lifting operations (see 5.49) shall not be performed by lone workers, unless other suitable control measures are implemented to reduce the risk.
- 5.54.3 A register of the names of all lone workers, of their planned location and activity must be kept by the control room or the direct supervisor.
- 5.54.4 Communication means must be maintained with lone workers. This shall include:
- the use of a suitable "lone-worker device", triggering an alarm in case the worker is not moving, and/or;
  - Regular radio communication from the lone worker to the supervisor or control room, and / or;
  - Scheduled checks on the lone worker by other employees or security personnel.

### 5.55 Live systems & LOTO

- 5.55.1 Access to live systems must be prevented, so far as is reasonably practicable, to avoid unintentional exposure to their inherent hazards. All electrical systems, plant, equipment, apparatus, wires and cables must be presumed live unless proved dead. Consideration must be given to stored energy that may be retained in plant, equipment and apparatus after its disconnection/isolation from the system. Non-insulated conductors shall not be touched





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whenever cable ends cannot be observed. The following table describes the minimum control measures that must be applied to specific types of systems.

Table 3: Minimum control measures for live systems

Type of system	Risk / Impact	Control
Electrical transformers, substations, electrical rooms.	Electrical shock by direct contact or arc.	<p>Access to live electrical rooms shall be posted with safety signs prescribing the use of insulated or non-conductive tools only.</p> <p>Full enclosure at a distance equal to or greater than the outer limit of the Vicinity Zone (see 7) from any exposed live part.</p> <p>Access control by a door(s) that remains closed and secured whenever works are not undertaken within the enclosure.</p> <p>Door(s) lock(s) must be operated by unique keys.</p> <p>Door(s) lock keys must be kept by the Authorized Person in charge of the system, and be controlled with a high-control Permit to Work.</p>
Electrical cabinets	Electrical shock by direct contact or arc.	<p>Electrical cabinets closed and secured whenever works are not undertaken inside them.</p> <p>Electrical cabinet tagged with the signs and warnings indicating the presence of electrical hazard. If not reasonably practicable, a restricted area (physical delimitation supported by warning signs) shall be implemented around open live equipment.</p>
Buried systems	Electrical shock by direct contact, explosion, exposure to harmful hazardous substances, contamination of soil and groundwater	<p>Buried services must be marked on as-built drawings.</p> <p>Underground warning mesh must be laid over the buried service, at a distance of at least 50 cm from the service.</p>
Cable trays and pipe racks	Electrical shock by direct contact, explosion, exposure to harmful hazardous substances, release of greenhouse gases or VOCs to the atmosphere.	<p>Fire-protection system operational and energized prior to any fuel oil / fuel gas system is energized.</p> <p>Identification of piping with the nature of the fluid they convey, their physical properties (temperature, pressure), and direction of the fluid.</p>
Effluent treatment plant and outfall channels	Exposure to biological agents and pathogens, exposure to hazardous substance, risk of drowning (negative buoyancy zones).	<p>Full enclosure, access controlled by PTW or equivalent.</p> <p>Areas of negative buoyancy fully barricaded.</p>
Site drains (process-water, storm-water, surface-water) and associated systems (e.g. oily-water separator)	Contamination of surface water.	Interceptors and other environmental protection systems must be operational and energized prior to any substance is brought on site that could lead to the contamination of surface water.
Coal / ash conveying systems	Exposure to moving parts, risk of being drawn in mechanical parts.	All moving parts (including the conveying belt) must be protected with suitable safeguarding means
Fuel oil / fuel gas systems (e.g. tanks, piping, compressors, etc.)	Fire, explosion.	<p>Full enclosure at a distance equal to or greater than the outer limit of explosive zone 1 (see 5.4).</p> <p>Access control by a door(s) that remains closed and secured whenever works are not undertaken within the enclosure.</p> <p>Door(s) lock(s) must be operated by unique keys.</p> <p>Door(s) lock keys must be kept by the Authorized Person in charge of the system, and be controlled with a high-control Permit to Work.</p> <p>Fire-protection system operational and energized prior to any fuel oil / fuel gas system is energized.</p>

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Type of system	Risk / Impact	Control
Demineralization plant, neutralization sump, other water treatment systems	Exposure to harmful hazardous substances.	Full enclosure of the building / area. Access control by a door(s) that remains closed and secured whenever works are not undertaken within the enclosure. Door(s) lock(s) must be operated by unique keys. Door(s) lock keys must be kept by the Authorized Person in charge of the system, and be controlled with a high-control Permit to Work. Emergency shower and decontamination systems operational and energized before charging of any hazardous substance.
Fly-ash silo, bottom-ash silo, electro-static precipitators, fabric filter houses, ash ducts.	Fire / explosion, exposure to harmful hazardous substances (dust), asphyxiation / engulfment.	Full enclosure of the building / area. Access control by a door(s) that remains closed and secured whenever works are not undertaken within the enclosure. Door(s) lock(s) must be operated by unique keys. Door(s) lock keys must be kept by the Authorized Person in charge of the system, and be controlled with a high-control Permit to Work. Ventilation and fire protection systems operational and energized prior to the charging of any concerned system.
Flue Gas Desulphurization	Thermal burns due to exposure to hot liquid, chemical burns due to exposure to corrosive substances, or combination thereof.	Warning signs applied on all systems where there is a risk of leaks of corrosive or hot substances, and to all external piping where they may be a risk of burn by direct contact.

5.55.2 Exposure to electrical hazard shall be managed according to the requirements mentioned in sections 7 & 8

### 5.56 Manual handling

- 5.56.1 Preference shall always be given to mechanical or mechanically assisted lifting, with certified purpose-made lifting equipment so far as is reasonably practicable.
- 5.56.2 Each manual handling operation shall be assessed, based on its particular characteristics including: size and shape of load, frequency and duration, personnel skill and physical ability, distance to be carried and work heights.
- 5.56.3 A specific ergonomic risk assessment shall be prepared for any task which would require unusual or significant manual handling, as well as those involving manual lifting of loads above 25kg for males or 10kg for females or young workers.

### 5.57 Material Storage and Racking Systems

- 5.57.1 When establishing storage areas, GE and contractors shall consider the need to minimise H&S risk or environmental impact and to maintain adequate access and egress. Materials, waste, plant and equipment shall be stored with due regard to the risks posed to pedestrians, vehicle traffic and site personnel. Where the risk of interference is high, compounds shall be constructed to provide a secure enclosure. Only the minimum quantity of hazardous substances and waste will be stored on site and unpacking of material shall be carried out as much as possible in the laydown area.
- 5.57.2 All material in bags, containers, bundles, or stored in tiers shall be stacked, blocked, interlocked, and limited in height so that it is stable and secured against sliding or collapse.
- 5.57.3 Materials that could become damaged, or affected by exposure to the elements shall be adequately covered or stored indoors.



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- 5.57.4 Materials shall not be stored directly under power lines unless safe clearance/distance from all materials to the power line is achieved.
- 5.57.5 Noncompatible materials shall be segregated in storage.
- 5.57.6 The heaviest load shall be stored on the bottom shelves of the racking system and lighter loads on the upper shelves.
- 5.57.7 All material being stored on racks over 3 meters from the ground shall be secured (banding/wrapping) together or to the pallet so to reduce the hazard of elements falling from height while being stacked or picked up.
- 5.57.8 The maximum height of stacked materials shall stay 1 meter below sprinkler heads, as a minimum.
- 5.57.9 The racking system design must be compatible with the pallets and the materials handling equipment in use within the workplace
- 5.57.10 The width of aisles between elements of the racking system must be sufficient to allow forklift trucks or other material handling equipment to maneuver easily (i.e. be able to make a U-turn in one attempt).
- 5.57.11 It is strictly forbidden to make any alterations to uprights, bracings, beams or components of racking systems, such as welding on additional cleats or bearers.
- 5.57.12 Racks shall have their maximum load rating clearly posted.
- 5.57.13 Racks shall be anchored to the floor or to the wall to prevent tipping.
- 5.57.14 Back stops must be used to ensure a pallet is not pushed out by the pallet going in front of it.
- 5.57.15 In areas with powered industrial vehicle traffic, the end unit of the racking systems (vertical frame) must be protected against collisions with vehicles, with a post guard or equivalent.
- 5.57.16 The height of the racking system must be within the limits of the foreseen loading/unloading equipment.

### 5.58 Noise – occupational exposure limits

In absence of local regulations, or in presence of less stringent regulations, the following shall be considered as the occupational exposure limits to be applied on all GE GPS sites:

Table 4: Noise - Occupational Exposure Limits

Duration of exposure	First action level	Second action level	Maximum exposure level
8 hours - average measurement in dB(A)	80	85	87
Short – peak measurement in dB(C)	135	137	140

### 5.59 Noise – prevention and hearing protection

- 5.59.1 Noise levels must be maintained below the first action level, so far as is reasonably practicable. To do so, the following measures may be implemented:
- Design and install silencers and soundproof enclosures on equipment generating noise likely to expose personnel to levels higher than the second action level;
  - Direct vents and pressure release valves as far away from site personnel or areas likely to have personnel as possible;
  - Schedule particularly noisy activities (e.g. piling) at times where it is likely to expose a smaller number of persons;
  - Provide “silent havens”, closed rooms, that are well insulated or sound proofed, where personnel exposed to high noise levels can rest.





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- 5.59.2 Work areas where noise levels may be higher than the first action level shall be specifically marked. In addition, access to areas where noise levels may be higher than the second action level must be physically restricted.
- 5.59.3 All work plant and equipment that emits a noise level higher than the second action level in normal operating condition must be specifically marked in a way that is visible by its operator(s), and that requires them to use hearing protection while operating the equipment.
- 5.59.4 If noise levels exceed the first action level, exposed employees must be made aware of the risks and associated control measures. Appropriate PPE must be made available to all exposed persons.
- 5.59.5 If noise levels exceed the Second Action Level, the use of hearing protection shall be obligatory.
- 5.59.6 Beyond the maximum exposure level, double protection must be used, i.e. ear plugs combined with ear muffs.

### 5.60 Overhead electric power lines and other services

Overhead electric power lines and other services includes all power lines, instrumentation cables, pipes, earthing cables, communication cables including fiber glass, etc.

- 5.60.1 Where there is a risk, suitable barriers must be erected by either the client or GE. Where barriers are not in place work cannot commence.
- 5.60.2 Storage of materials in the area between the overhead service(s) and any ground-level barrier is prohibited. **Where the use of mobile cranes will be required to unload and load equipment and materials, consideration will be given to the location of overhead power lines when developing storage areas.**
- 5.60.3 Whenever it is not reasonably practicable to avoid vehicles crossing beneath overhead services, the passageway shall be fenced on both sides and goal posts erected at each end to act as gateways in the barriers running parallel to the overhead service. The goal posts must be constructed from rigid, non-conductive material and distinctively marked, for example, red and white stripes. At both sides of the passageway, on or near the goal posts, warning notices and cross-bars shall indicate the clearance height and to instruct drivers to lower jibs, tipper bodies etc. and keep below this height while crossing. Notices and cross-bars shall be sufficiently lit to be seen during the night or in deteriorated visibility conditions.
- 5.60.4 If it is not reasonably practicable to avoid performing works beneath overhead services, the following distances shall be considered for the establishment of an exclusion zone around them according to their type and voltage:
  - Water and compressed air piping, LV line: 1 m;
  - Hazardous substances and steam piping: 3 m;
  - Stationary works near to a MV/HV line: limit of "vicinity zone" as described in 5.17.1;
  - Works using moving machines (e.g. crane, MEWP) near to a MV/HV line: 2 meters in addition to the limit of "vicinity zone" .
- 5.60.5 Any work with a potential for an individual, equipment or conductive material (e.g. crane jib, scaffold pole, conductive ladder) to enter such exclusion zone shall be considered as a high control high-risk activity and controlled as such.
- 5.60.6 Additional control measures that may be implemented whenever any work with a potential for an individual, equipment or conductive material to approach or enter the exclusion zones include, but are not limited to:
  - Physical or electronic movement restriction;
    - Earthing systems;
    - Faraday cages;



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- Continuous monitoring of the distance between the part of the machine that is the closest to the service and the service.

### 5.61 Pest / vermin

- 5.61.1 Adequate food waste disposal areas with tightfitting garbage lids shall be supplied.
- 5.61.2 The surroundings of the site shall be kept free of rubbish accumulation and of overgrowth of weeds and grass.
- 5.61.3 As a last resort, pest-control methods shall be engaged (see 5.62).

### 5.62 Pest control

- 5.62.1 Pest control services shall only be conducted by competent and specifically qualified personnel or organizations.
- 5.62.2 Information about current pest control treatments (location and hazards) must be made available to all site personnel.

### 5.63 Personal Protective Equipment (PPE) – Standard PPE on all sites

The following PPE is mandatory at all times for all personnel and visitors, and shall be provided by each employer to their employees, free of charge:

- 5.63.1 **Safety helmet** – in accordance with EN 397:2012 or equivalent must be worn at all Project sites (except in completed office and control rooms).
- 5.63.2 For work at height the helmet or industrial bump cap shall be fitted with a chin-strap.
- 5.63.3 **Safety footwear** – S3 code in accordance with ISO 20345:2011 or equivalent must be worn.
- 5.63.4 **Protective work clothing** – Legs, arms and body shall be covered by protective clothing adapted to the type of work and the work environment:
  - Long trousers and long sleeves that protect against the risk of abrasion, cuts, contact burns and sun burns shall be used on Project sites (high-visibility vests – see 5.63.6 – with long sleeves may be used, as long as they are made of a solid material providing sufficient protection), and;
  - The fabric used for work clothing shall be unblended cotton, so far as is reasonably practicable.
- 5.63.5 **Eye protection** – all personnel on Project Sites (except in office and control rooms) shall wear eye protection, and as a minimum:
  - Safety spectacles offering an eye and side protection against impact in accordance with EN 166:2001 or equivalent must be worn at all times;
  - Corrective glasses must comply with the requirements of safety spectacles (EN 166:2001 equivalent) and must offer side protection against impact or must be otherwise protected with over-spectacles that comply with the requirements of safety spectacles.
- 5.63.6 **High visibility jacket or vest** – of class 2 according to ISO 20471:2013, or equivalent:
  - Must be worn by all pedestrians on Project sites (except in completed office and control rooms), and;
  - Must be worn by all personnel working on the field.
- 5.63.7 **Safety gloves** – safety gloves adapted to the task being performed must be worn to protect hands against injury. Working without gloves is only permitted where no risk to the hands exists or where the work cannot be safely performed while wearing gloves.



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Figure 12: Workers wearing helmets with chin straps, safety goggles and high-visibility garment

### 5.64 Personal Protective Equipment – Specialized and additional PPE

- 5.64.1 Additional PPE may be required based on the analysis of EHS risks and impacts.
- 5.64.2 A full-face shield/visor must be worn when cutting or grinding metals and concrete (See Figure 13).



Figure 13: Helmet fitted with a face shield and a chin strap

- 5.64.3 For personal fall prevention and protection, full-body harnesses (i.e. attached to the legs, the waist and passing over the shoulders), with double line lanyard, must be used.
- 5.64.4 When persons are exposed to high-voltage electricity (i.e. where there is a risk of electrical arc flash), specifically designed PPE (clothing, gloves and helmets) that provide a protection against the maximum foreseeable energy its wearer may be exposed to must be used.
- 5.64.5 Wherever working in a potentially explosive atmosphere, the fabric used for all clothing must be anti-static.
- 5.64.6 Whenever performing or being exposed to hot works, the fabric used for all clothing must be of a fire-proof material so far as is reasonably practicable.
- 5.64.7 Whenever performing or being exposed to hot works, the fabric used for all high-visibility garments must be of a fire-proof material (e.g. cotton), so far as is reasonably practicable. If this is not possible, then the high-visibility vest may be removed during the execution of the work, and for as long as its wearer is exposed to ignition sources. It must be worn again immediately as soon as the risk of catching fire does not exist anymore.



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5.64.8 Whenever using or being exposed to hazardous substances (in particular corrosive and flammable substances), additional PPE adapted to the risk of the substance and in line with the requirements of the MSDS must be used.

5.64.9 Lifejackets and Personal Floating Devices are covered in section 5.2.10 of this document.

### 5.65 Plant, equipment and machines – hand tools

5.65.1 Hand tools, especially hammers, are a common cause of hand injuries. Consider in the risk assessments to:

- Avoid tools such as chisels being hand-held by one employee and struck by another. Use tongs or a chisel holder to guide the striking tool so that the holder's hand (arm, head) will not be injured
- Secure impact tools (e.g. chisels) and hammers appropriately, so that they do not become flying objects.
- Always grip a spanner/wrench, so that the hands will not strike adjacent objects when the bolt loosens.

5.65.2 Box or socket wrenches / spanners must be used instead of open-end or adjustable wrenches / spanners so far as is reasonably practicable, as they are less likely to slip when used. If this is not reasonably practicable, adjustable and open-end wrenches must always be pulled towards the operator when being used, never pushed away.



Figure 14: Box wrench



Figure 15: Socket wrench, universal joint and sockets. Picture by Kae, CC BY-SA 3.0

5.65.3 Wrenches must not be used as hammers.

5.65.4 Wrenches must not be struck with a hammer.

5.65.5 Screw drivers and pliers must be fitted with insulated handles.

5.65.6 The use of adjustable wrench shall be limited to light tasks / low force applications.



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Figure 16: Adjustable wrench. Picture by MrX, CC BY-SA 3.0

### 5.66 Plant, equipment and machines – general requirements for machines

- 5.66.1 A detailed competency matrix should be prepared to ensure that all persons working on machines or supervising work on machines are competent prior to assignment
- 5.66.2 Prior to using a machine being delivered at site, GE/contractors shall organize a joint inspection with the GE SEHSM or nominee to assess compliance and review documentation.
- 5.66.3 Detailed manufacturer's or employer's instructions and information shall be made available to users. Machines, equipment (including hoses) and tools shall only be operated within limits defined by the manufacturer and as per their intended use. They shall comply with all applicable regulations, norms and standards.
- 5.66.4 The preventive maintenance programmed for machines (which shall include construction vehicles), including periodic checks of the machine condition (such as hydraulic system conditions, potential mechanical fatigues), including the checking of primary and secondary safeguarding and emergency shut-down systems will be completed. Records will be kept in the maintenance log book.
- 5.66.5 All machines shall be capable of being isolated using LOTO means.
- 5.66.6 When reenergized, no machine or portable powered tool shall be allowed to start by itself.
- 5.66.7 Access to all dangerous parts of machines must be prevented so far as is reasonably practicable by physical means (primary safeguarding) that must be in place when the machine is operating.

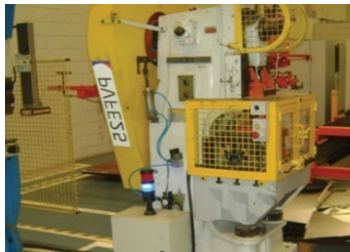


Figure 17: primary safeguarding around dangerous parts of a machine

- 5.66.8 Secondary safeguarding, such as infrared beams or light curtains, may be required, according to local regulation or risk assessment.
- 5.66.9 Removing or by-passing primary or secondary safeguarding is strictly forbidden at any time during normal operation.





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- 5.66.10 During maintenance or breakdown situations, where removing or by-passing primary or secondary safeguarding is required, work must be subject to a high control Permit to Work, to identify and apply suitable precautions to ensure the safety of persons concerned. This may include but shall not be limited to Lockout / Tagout (see 5.55).
- 5.66.11 When changing tools, adjusting, setting up or cleaning a machine, the operator must switch off the automatic mode and isolate the power source (Lockout / Tagout, see 5).
- 5.66.12 It is strictly prohibited to operate any machine while wearing headphones or earbuds.
- 5.66.13 Wearing loose clothing or having loose long hair is prohibited for people working on machines. Care must also be taken so that jewelry is not drawn into operating machines.
- 5.66.14 Gloves shall not be worn when operating machines with exposed rotating parts, to avoid entanglement and drawing-in e.g. drill press, lathe, milling machine, etc.
- 5.66.15 Warnings such as 'Do not operate without guards', 'Do not wear loose clothing', and other appropriate warnings on specific PPE requirements according to regulation or risk assessment must be fixed on the machine, in languages understood by the concerned workers.
- 5.66.16 Access into areas where any moving parts of machinery (or of the work piece being machined) presents the risk of striking or trapping a person, must be prevented by suitable hard-barriers at a safe distance, so far as is reasonably practicable.
- 5.66.17 When it is not reasonably practicable to do so, such dangerous parts of machinery must be painted in yellow and black stripes, or vested with yellow and black striped soft material.
- 5.66.18 Emergency shut-down systems (e.g. pressure-sensitive body bar, emergency stop buttons, emergency pull cords) must be fitted to all machines, and accessible at less than 1.2 meters from any position which can be accessed by machine operator(s) or helpers, and stop the machine cycle in the shortest practical time to prevent or minimize injuries when activated.
- 5.66.19 All faulty or unsuitable machines (including portable equipment) must be quarantined, locked out and tagged out of service. Repairs shall only be performed by authorized persons.
- 5.66.20 The following general hierarchy of controls must be considered when controlling the risks associated with the use of machines, in this order of priority:
- 1) Eliminate or substitute the hazard,
  - 2) Engineering controls: fixed guards, automatic guards, interlock guards, two-hand controls, dead-man switches, trip devices such as pressure mats, 360-degree telescopic probe switches, etc.,
  - 3) Administrative controls: permit to work, training, signage, etc.,
  - 4) Special tooling such as push-sticks, jigs and fixtures
  - 5) PPE.
- 5.66.21 All work plant and equipment that emits a noise level higher than the second action level (see 5.58) in normal operating condition must be specifically marked in a way that is visible by its operator(s), and that requires them to use hearing protection while operating the equipment.
- 5.66.22 All rotating accessories, in particular discs (on abrasive wheels and grinders) must be mounted on machines which rotating speed does not exceed the maximum rated rotating speed of the accessory.

#### 5.67 Plant, equipment and machines – vehicles

Unless specifically stated otherwise, this section also applies to vehicles provided by GE GPS to its employees, also when they are used outside of working hours.

- 5.67.1 All permanent site-based vehicles on project sites must be fitted with operational rotating / flashing lights, reversing sound-alarms, and seatbelts for all seats.
- 5.67.2 All vehicles on site must be fitted with an operational parking brake.



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- 5.67.3 All permanent site-based vehicles must be equipped with a fire extinguisher installed in a way to be readily accessible, and inspected in accordance with the applicable requirements.
- 5.67.4 Seatbelts shall be fastened when the vehicle is being moved.
- 5.67.5 Windows and windscreens must be constructed with safety glass complying with the requirements of BS 857:1967 'Specification for safety glass for land transport' or equivalent, free of any cracks that hinder vision.
- 5.67.6 All vehicles on site must be fitted with front position lamps, turn signals, rear position lamps, stop lamps (including center high mount stop lamp, so far as is reasonably practicable), reversing lamps and hazard flashers. All vehicle lights must be fully operating and not damaged.
- 5.67.7 It is strictly forbidden to use the mobile phone while driving a vehicle (including with a hands-free device).
- 5.67.8 Other than the operator/driver, anyone riding on a vehicle or equipment not designed for the purpose is forbidden.

### 5.68 Plant, equipment and machines – Electrical equipment

- 5.68.1 Electrical equipment, including cords, plugs and sockets, must be visually inspected before use.
- 5.68.2 Sockets, power strips and extension cords used on Operational Sites (except in office and control rooms) shall be of industrial standards whenever such standards exist in the country of operation, and sized and rated in line with their foreseen use (see Figure 18).

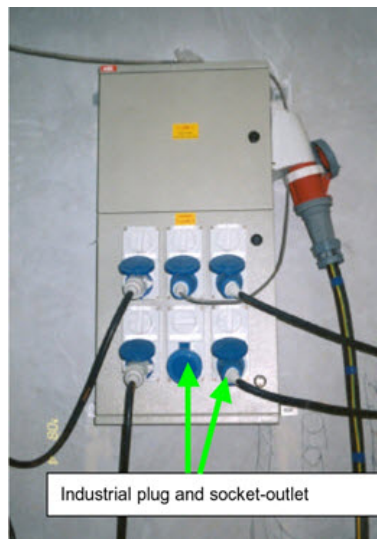


Figure 18: Industrial standard for cords, plugs and sockets

- 5.68.3 Electrical cords must always be fully extended (not wrapped around cable reels).
- 5.68.4 Live parts of electrical equipment must be protected from accidental contact.
- 5.68.5 All live electrical installations must be clearly marked as such.
- 5.68.6 Access to high-voltage installations must be physically prevented, at a distance from the live parts equal to or greater than the limit of the Vicinity Zone (see 7).
- 5.68.7 Electrical equipment that may generate important heat (e.g. halogen lamps, electrical radiators) must only be used away from flammable material.
- 5.68.8 All electrical equipment must be grounded, either by connection to the grounded electrical infrastructure (see 1) or by applying local earths.



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- 5.68.9 Ground Fault Circuit Interrupters (GFCI, also referred to as Residual Current Devices – RCD) shall be installed at the power supply of distribution boards, generators and transformers whenever the output voltage is equal or greater than 240 volts. GFCIs shall be rated for a sensitivity of 30 mA (for protection against electrical shock), with a maximum break-time of 0.3 seconds for this value of residual current.
- 5.68.10 GFCIs shall be tested to verify that they function normally by pressing the dedicated push-button, at least once per month. In addition, they shall be thoroughly tested by a competent person to verify that they effectively break the circuit within the required break-time when the residual current exceeds the designed rating.
- 5.68.11 Distribution boards, electrical cabinets and panels shall have the means of electrical isolation located on the outside of the cabinet, so far as is reasonably practicable. They must be protected by fuses or circuit breakers and a GFCI, must be earthed and must have lockable doors that remain locked at all times, and that may only be unlocked by authorized persons. Non-authorized persons shall only have access to plugs or switches placed outside of the cabinet/board.
- 5.68.12 GFCIs (as described in 5.68.9) must be installed at the power supply of arc welding machines.
- 5.68.13 In potentially wet environments, any electrical equipment where water can come into contact with it, shall be placed above ground and be of an appropriate water protection degree (minimum IPx4 rating according to IEC 60529, or equivalent).
- 5.68.14 Electrical cords must be fitted with cable glands at each end, so that all conductors remain safely attached (see Figure 19).



Figure 19: Cable glands

- 5.68.15 Electrical cables/cords shall not be laid over roads or walkways. If not reasonably practicable, they shall be protected against damage by a sustainable mean above or below ground or safely suspended at height.
- 5.68.16 Plugs shall not be removed from sockets or electrical equipment moved/handled by pulling the cable. Plugs/connections shall not be touched with wet hands.
- 5.68.17 Damaged electrical equipment must be removed from service and may only be repaired by a competent electrician.
- 5.68.18 Batteries and battery charging installations must be located in ventilated areas and provided with appropriate containment in case of leakage (see 5.38).

### 5.69 Plant, equipment and machine – GIS & AIS equipment

- 5.69.1 During the erection phases all the compartments must be labelled with pressure indication - see examples of labels to be used.





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### 5.69.2 Preventing pressure equipment volume failure

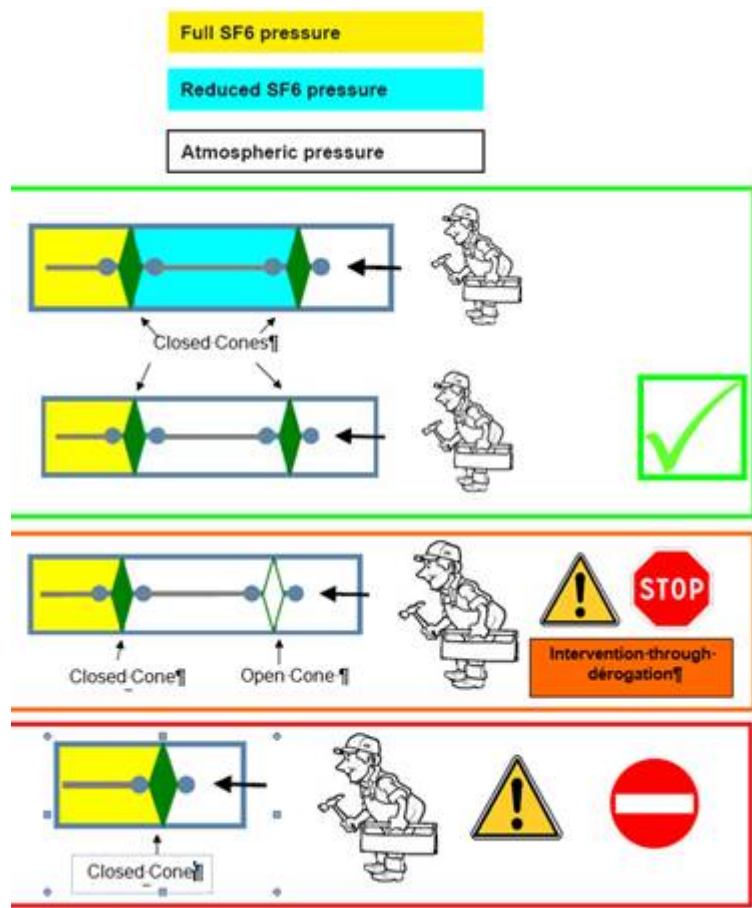
- 5.69.2.1 Never pressurise gas compartments over the recommended pressure stated on the operating instruction, or on the nameplate of the equipment (Service pressure).
- 5.69.2.2 All equipment must be fitted with a safety pressure device during the filling process, as a minimum a pressure reducer must be fitted.
- 5.69.2.3 Although all insulators are tested up to 3 times their operating pressure during routine testing, a significant risk of rupture remains for insulators that could have been damaged during either shipping or handling. This risk is highest when first installing equipment and during initial pressurisation and first equipment operation. This risk must be brought to the attention of the site personnel, customer or sub-contractors and must be included in the site safety plan. The establishment of a safety perimeter is mandatory to prohibit the presence of any person during the first gas filling and or during the first mechanical operations after installation.
- 5.69.2.4 Where it is not possible to maintain a 50m safety perimeter, all possible steps should be taken to reduce this risk by establishing the necessary safeguards to prevent possible projection of ceramic fragments.
- 5.69.2.5 For work adjacent to a pressurised gas zone, a Competent Gas Handler must carry out an assessment to determine under what conditions the work is to take place and if a gas zone Permit to Work is to be issued.
- 5.69.2.6 No person must engage in any work on or near any pressurised SF6 filled Gas Zones in which uncontrolled hazards may arise unless:
  - A risk assessment has been carried out and sufficient controls are in place for work on or near a Pressurized Gas Zone during the filling process.
  - Suitable precautions (adhering to a hierarchy of controls which includes where necessary the provision of suitable protective equipment) are taken to prevent injury.
- 5.69.2.7 Working adjacent to a pressurised gas zone can only be carried out when the following can be achieved;
  - A vacuum of -1 bar g has been drawn and maintained within the enclosure to be worked in for 1 hour with the vac-pump isolated.



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- There are two (2) or more Open Barriers in between the pressurised Barrier and the area where the work is to take place.



In any case: -

- The HV Plant/HV Equipment must be designed to withstand differential pressure across the Insulating Barrier.
- No work is to be undertaken on the busbar or Barrier that could cause stress to the pressurised Barrier, unless controls are implemented to prevent damage to the pressurised Barrier.
- It is not reasonably practicable to reduce the adjacent gas zone to atmospheric pressure.
- No known or suspected mechanical or electrical damage has been sustained to the pressurised Barrier.

### 5.69.3 Live topping-up of SF6 equipment

- 5.69.3.1 Topping up of live SF6 equipment must not be carried out on equipment where a fault has occurred.
- 5.69.3.2 Where reasonably practicable live topping up must not be carried out on in-service equipment which is on load.
- 5.69.3.3 Where possible the circuit should be de-energised and out of service before live topping-up is carried out.



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- 5.69.3.4 If the circuit cannot be taken out of service and live topping up is required, the following controls must be applied: -
- All topping up must be carried out before reaching alarm level 2.
  - The maximum pressure difference between the outlet reducer and the switchgear must be limited to 0.5 bar to fill to avoid the disturbance of any settled particles in the switchgear.
  - Topping-up must always be carried out with new gas to avoid introduction of any particles.
  - The SF6 tool pipe from the bottle must be equipped with a non-return valve and filled with equivalent pressure within the equipment.
  - All the body parts of the operator must be below the first isolator ceramic fin (mainly for the low ranges in AIS live tank).
  - PTW must be issued by an Operational Supervisor.

### 5.70 Plant, equipment and machines – Hydraulic equipment

- 5.70.1 All hoses and couplings shall be visually inspected before use.
- 5.70.2 When not in use, hoses and couplings shall be emptied of oil and stored in a dry location without direct exposure from the sun.
- 5.70.3 Hoses and couplings shall only be used for their designed purpose and capability (e.g. maximum pressure rating, chemical resistance, etc.).
- 5.70.4 Hoses and tools with quick release valves or fittings shall be fitted with whip restraining systems (anti-whipping system, see Figure 20).



Figure 20: "Whip arrestor" fitted on a quick-release hydraulic piping coupling

- 5.70.5 Portable jacks and Power Pack must be installed on drip trays.
- 5.70.6 Spill kits must be readily available.
- 5.70.7 Maintenance and operation of hydraulic hoses shall always be done directly over drip trays.
- 5.70.8 Suitable PPE shall be worn when operating or working on hydraulic tools, plant and equipment such as oil-resistant gloves, full eye protection (closed goggles) or face shield, long trousers and long sleeves.



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- 5.70.9 When decoupling hoses, it shall be ensured that the stored energy has been released (operation of a relief valve after the pump has been stopped).
- 5.70.10 Specialized hydraulic tools such as turbine and generator mountings or oil ejection equipment work at extremely high pressures (up to 1500 bar) and therefore shall only be used and maintained by authorized persons. In addition, all associated hoses, couplings, and equipment require special storage to prevent damage.

### 5.71 Plant, equipment and machines – pressurized work equipment

- 5.71.1 Any pressurized equipment or systems confirmed to be unsafe shall be locked out if practicable, and tagged "OUT OF SERVICE, DO NOT USE" or equivalent. Use of such equipment shall be prohibited until the unsafe condition is corrected.
- 5.71.2 All pressurized equipment and systems shall be equipped with approved safety or relief valves and pressure gauges.
- 5.71.3 The discharge from safety/relief valves and blow-offs shall be directed away from personnel.
- 5.71.4 All elements of the pressurized system (including but not limited to: compressor, hoses, couplings, tools) shall be pressure-rated by the manufacturer.
- 5.71.5 Hoses and tools with quick release valves or fittings shall be fitted with whip restraining systems (anti-whipping system, see Figure 20).
- 5.71.6 The use of "jubilee" clips on pressure systems is strictly prohibited (see Figure 21).



Figure 21: "jubilee" clip

- 5.71.7 All compressors and pressurizing equipment shall automatically stop before the discharge pressure exceeds the maximum working pressure allowable on the weakest element of the system.
- 5.71.8 A stop valve shall be installed at each outlet of hoses. The stop valve shall be closed when a tool is being changed, repaired, and adjusted.
- 5.71.9 The stored pressure in hoses shall be discharged before decoupling hoses. To do so, the pressure shall be released by using a relief valve or blow-off after the pressurizing equipment has been disconnected.
- 5.71.10 Pressure hoses must be free of cuts, cracks and worn places and must be prevented from contact with sharp edges, corners, falling metal, sparks or open flames. Protective covers shall be used where the risk of damage is significant.
- 5.71.11 Hoses shall not be laid over roads or walkways. If not reasonably practicable, they shall be protected against damage by a sustainable mean above or below ground or safely suspended at height.
- 5.71.12 The use of compressed air for blowing dirt off hands, face or clothing is strictly prohibited.



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### 5.72 Plant, equipment and machines – portable power tools

- 5.72.1 All portable electrical equipment must be provided with GFCIs, or shall be grounded (earthed) or double insulated, and connected to the electrical supply through a residual current device (see 5.68.9).
- 5.72.2 Electrical cords shall be in good condition.
- 5.72.3 In possibly wet environment, any electrical equipment where water can come into contact with shall be placed above ground and be of an appropriate water protection degree (minimum IPx4 rating according to IEC 60529, or equivalent).
- 5.72.4 Hoses and tools with quick release valves or fittings shall be fitted with whip restraining systems (anti-whipping system, see Figure 20).
- 5.72.5 Portable circular saws, grinders and magnetic drilling machines must be provided with safeguarding around non-active movable parts.
- 5.72.6 All portable power tools must be fitted with a system that prevents unintentional start (e.g. interlock), or should be unplugged from the power source when not in use.
- 5.72.7 Hand-held power tools fitted with accessories (discs, wheels, bands, bits, blades, etc.) used for the purpose of cutting or grinding any material must be fitted with a switch that cannot be locked in the "on" position ("non-latching ON switch", "dead-man switch"). Non-impact drills and magnet drills may be exempted from this requirement.
- 5.72.8 It is strictly forbidden to bypass or otherwise tamper with safety devices, including non-latching switches and dead-man controls.
- 5.72.9 Whenever a handle is provided by the manufacturer, the tool must have it fitted. It is strictly forbidden to remove the handle.
- 5.72.10 Operators shall use the tool by holding the tool with two hands, and holding the handle whenever fitted.
- 5.72.11 When changing tools, adjusting, setting up or cleaning a portable power tool, the operator must disconnect it from its source of power (e.g. remove the battery, unplug the power socket, detach the compressed air hose, etc.).
- 5.72.12 Temporary lighting shall be equipped with guards to prevent accidental contact with the bulb.
- 5.72.13 Lights shall not be suspended by their cords.

### 5.73 Plant, equipment and machines – refueling

- 5.73.1 Refueling of plant and equipment shall only be performed by competent persons.
- 5.73.2 Refueling of plant and equipment with more than 20 Liters of very flammable fuel (e.g. gasoline) shall be considered as a high control activity and controlled as such (high control Permit to Work).
- 5.73.3 The refueling area shall be provided with at least one fire extinguisher. Flammable liquids with a flashpoint below 37.8 degrees Celsius (100 degrees Fahrenheit) shall be kept in closed containers or tanks when not in use.
- 5.73.4 Containers of a capacity lower than 20 Liters must be appropriate, and designed for the purpose (e.g. jerry-cans), with an appropriate filling spout or funnel.
- 5.73.5 All refueling activities must be done over drip trays; emergency spill kits and adequate fire extinguishers must be immediately available.



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5.73.6 Fueling equipment and equipment being fueled must be grounded/earthed to eliminate static voltages.

### **5.74 Plant, equipment and machines – compressed gas cylinders and associated equipment**

5.74.1 Whenever the gas stored in cylinders is a hazardous substance, the requirements of 5.36, 5.37, 5.38 and 5.39 must apply.

5.74.2 Compressed gas cylinders shall be stored in areas with good ventilation, where the temperature can be easily monitored, and out of direct sunlight.

5.74.3 Storage areas must be clearly marked with clear and visible signage to highlight that smoking and naked flames are prohibited.

5.74.4 Storage areas for compressed gas cylinders must have a level concrete base. For hazardous gases that are heavier than air (e.g. propane), storage areas must be free of open drains where gases could accumulate and generate a risk.

5.74.5 Compressed gas cylinders must always be stored upright and shall be secured to prevent falls.

5.74.6 Cylinders containing flammable gases must be separated from those containing oxidizers (including oxygen), as required by 5.38.

5.74.7 Cylinders used for the transportation of compressed gases must be specifically designed, manufactured and when relevant approved for that purpose.

5.74.8 Compressed gas cylinders must be clearly marked with labels identifying their contents. Color coding alone shall not be relied upon to identify the contents of compressed gas cylinders.

5.74.9 Compressed gas cylinders and associated equipment must be marked with the date of their last hydrostatic testing and / or the date of their next due hydrostatic testing, and their maximum allowable pressure.

5.74.10 Valves and fittings of compressed gas cylinders and other pressurized systems must not be used for lifting and carrying.

5.74.11 Compressed gas cylinders and fittings must be kept away from sources of contamination. Any contact between oxygen cylinders (and associated equipment) and oil and greases must be avoided. Compressed gas cylinders shall never be taken into areas with poor ventilation (see 5.35).

5.74.12 Protective valve caps must always be fitted onto compressed gas cylinders.

5.74.13 Compressed gas cylinders shall never be used for any purpose other than to contain pressurized gases.

5.74.14 Compressed gas cylinders and associated equipment must never be painted over, have any labels removed, or have any of their engraved markings changed, even if they are presumed to be empty.

5.74.15 It is strictly forbidden to use a flame to detect gas leaks from compressed gas cylinders and associated equipment. Leak detection must always be done by hearing and visual inspection, and / or the use of a soapy water solution.

5.74.16 Additional control measures must be implemented when there is a risk of frost bite due to cold temperatures associated with the sudden de-pressurization of a compressed gas or with the use of a cryogenic fluid. These measures may include but shall not be limited to appropriate PPE such as full-face shield and cryogenic handling gloves.

5.74.17 Gas cylinders shall be transported in accordance with the requirements set in 5.98.6.

5.74.18 The use of Teflon tape or other sealants is forbidden on the gas regulator fittings, as they may lead to breaking the retaining nut and therefore cause gas leaks.





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5.74.19 Appropriate gas regulator fittings must be used, and must not be modified in any way. Selection of gas regulator fittings must consider the pressure and temperature of the gas and its chemical properties.

### **5.75 Plant, equipment and machines – explosive-powered tools (explosive cartridges)**

- 5.75.1 The use of explosive-powered tools must be considered as Hot Works, and therefore be undertaken in compliance with the requirements of 5.40.
- 5.75.2 Explosive-cartridge tools must only be used by competent and authorized operators.
- 5.75.3 The explosive tool shall always be unloaded when not in use (including when being carried around or transported), serviced, adjusted or maintained.
- 5.75.4 The tool must be loaded with the barrel pointing in a safe position: away from persons and equipment, and surfaces off which the projectile may ricochet.
- 5.75.5 Face shields and hearing protection must always be worn when using explosive power tools, as well as the appropriate level of body protection and hand protection.
- 5.75.6 When not in use, tools and explosive cartridges must be stored in a designated and locked storage place, secured by at least the storekeeper and the GE GPS supervisor responsible for the job (e.g. 2 locks applied on the storage area, of which each person retains the keys).
- 5.75.7 All cartridges (used and unused) must be returned to the designated storage location upon completion of the job.
- 5.75.8 Works with explosive powered tools can only be undertaken upon the issue of a high control Permit to Work that must include requirements for restriction and barricading of the working area, etc.
- 5.75.9 The driving of pins, studs, fasteners and projectiles using explosive-powered tools is forbidden on very hard, brittle, very soft or thin material, i.e. whenever there is a risk of a projection of debris, projectile, or kick-back of the material.

### **5.76 Plant, equipment and machines – remote-operated**

- 5.76.1 Remotes must be fitted with devices that prevent an unintentional actuation of the controls (e.g. key or button to be maintained in a specific position).
- 5.76.2 The operator of remote-controlled equipment must be in direct visual contact with the equipment, its movement and the persons or property potentially exposed to collision with the equipment.

### **5.77 Pressure tests – general requirements**

- 5.77.1 A written test program specific to a pressure system and compliant with internationally recognized codes or standards (e.g. EN or ASME) must be completed and approved before any testing takes place.
- 5.77.2 Pressure test programs must include:
  - The name of the person responsible for the pressure test;
  - The maximum test pressure, duration of the test, and the testing medium to be used;
    - An up-to-date and annotated piping and instrumentation drawing;
    - The pressurization/depressurization cycle steps;
    - The pressure limits between which no access to the pressure system is granted;
    - The minimum temperatures of pressure system and testing medium below which the test cannot be performed;
    - An annotated lay-out of the pressure test area;



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- Details of essential persons required carrying out the inspection of the system during the pressure test;
- The emergency procedure.

- 5.77.3 Pressure tests schedule must be communicated and agreed upon during daily coordination meetings (or equivalent), and on Project sites at least one day before the test takes place, to allow sufficient time for the notification to be sent out.
- 5.77.4 On Project sites, one day before the beginning of any test, a notification must be prepared, issued and posted so that the following is communicated:
- the planned date, start time and duration of the test,
  - the name of the person responsible for the pressure test, and
  - The test area (including hazardous area) identified on a plan.
- 5.77.5 Test operators must be able to interpret observations made during the test, especially if there are some indications of potential failure of the system.
- 5.77.6 At least one pressure gauge must be placed to be visible from the pressuring equipment.
- 5.77.7 Pressure test equipment must be kept outside of restricted/Confined Spaces when practicable.
- 5.77.8 Only components that are certified and rated for the maximum test pressure can be used for the test. All equipment, components and accessories must be compatible.
- 5.77.9 It is recommended to use pressure gauges with a reading range being twice the maximum test pressure to allow accurate reading. In no case this range shall be below 1.5 times or above 4 times the maximum test pressure.
- 5.77.10 The adequate relief/overpressure devices (e.g. safety valve) must be available on the pressuring equipment with adequate relief flow line vented to a safe area.
- 5.77.11 System boundaries, e.g. flanges, manholes and other openings, must be blanked off using suitably rated blanking piece. Care shall be taken to ensure that seals are assembled in the correct order and orientation.
- 5.77.12 All bolts must be tightened in accordance with the correct torque as detailed in the written instructions.
- 5.77.13 All flanges, joints and gaskets shall be new and properly fitted.
- 5.77.14 The use of hoses should be kept as a minimum and they should be mounted so that there are no sharp bends or twist in the hose.
- 5.77.15 Any non-compliant pressure test equipment (e.g. no certificate, no pressure rating, damaged, not examined or inspected within the necessary time period) must be immediately removed from use and quarantined.
- 5.77.16 If a leak is found, before any remedial work on the system, all the pressurized system and equipment must be vented/drained and the pressure testing medium supply line disconnected or safely isolated (see 5.55.2).
- 5.77.17 The access to the hazardous area during the pressurization cycle must be restricted to the only authorized persons listed in the method statement.
- 5.77.18 Prior to starting any dismantling operation after the test, the responsible person must switch off and isolate the pressure pump and the testing medium supply line. He / she must then ensure that all parts have been depressurized and that no pockets of trapped fluid are present in the system.
- 5.77.19 When the testing medium used is considered as hazardous, it has to be released in a safe area or, if not reasonably practicable, a hazardous area has to be defined and physical barricaded.

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5.77.20 Accessories used during pressure tests (e.g. bolts, joints or gaskets) must go through a successful thorough examination prior to be re-used.

### 5.78 Pressure tests – hydrostatic tests

- 5.78.1 The method statement shall contain the sequence for opening vent valves when more than one venting position is to be used.
- 5.78.2 Hydrostatic pressure tests when the combination of pressure and volume of the pressure medium require a safety distance to be implemented from the system, to prevent persons to be injured by high-velocity fluid jets (puncture wounds), projectiles (in case of rupture), collapse of the system or its supporting structure shall be considered as high control high-risk activities, and be controlled as such.
- 5.78.3 Pressure systems being hydraulically tested must be totally filled with the pressure medium and properly vented through drains and vents to exclude air pocket, which could build up behind non-return valves, in dead legs or between isolation valves.
- 5.78.4 Bolt tightening on flanges during hydraulic test is only allowed when the pressure is less than 25% of test pressure.
- 5.78.5 It must be considered whether hydraulic testing medium may be contaminated upon completion of the test, and whether it should therefore be considered as hazardous waste, and handled as such.
- 5.78.6 Whenever reasonably practicable, water should be re-used for other pressure tests.

### 5.79 Pressure tests – pneumatic tests

- 5.79.1 Pneumatic pressure tests shall only be performed when a hydrostatic test is not practical and the applicable regulations allow it.
- 5.79.2 Pneumatic pressure tests over 1 bar-gauge shall be considered as high control high-risk activities and be controlled as such.
- 5.79.3 Under no circumstances shall a pneumatic test be performed with a flammable, toxic or greenhouse effect gas.

### 5.80 Professional travelling

- 5.80.1 When it is a safe alternative, and when it allows for lesser CO<sub>2</sub> emissions per traveler, train should be preferred to airplane for short and medium distance travel (when flight duration would be 1 hour or less).
- 5.80.2 It is strictly forbidden to travel with any airline not approved by GE.
- 5.80.3 Drivers shall plan trips to start at a reasonable time, include 15-minute breaks for each four hours of driving and end before 10:00 pm. If drivers feel they have overextended themselves and could be a hazard to themselves or others on the road, they shall pull-off the road and take an appropriate rest.
- 5.80.4 As a driver or passenger, it is mandatory to always fasten the seat belt, whether seating on a front or back seat.
- 5.80.5 Vehicles shall only be operated by persons who possess a valid driving license.
- 5.80.6 It is forbidden to operate vehicles when under the influence of alcohol, drugs or medication, when feeling effects of fatigue or illness, or in any other condition that would impair the ability to drive safely.
- 5.80.7 It is strictly forbidden to use a mobile phone or anything else (map, navigation system, etc.) that could distract the operator of a vehicle from driving it safely.

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5.80.8 It is strictly forbidden to use 2 or 3 wheels motorized vehicles for professional travelling (including "moto taxis") and on any GE GPS site.

### 5.81 Radiography activities – ionizing (radioactive) and X-ray radiation

5.81.1 Any work or activity on Site that requires the handling of radioactive materials and/or the use of equipment that can emit ionizing radiation shall be subject to a high control Permit to Work, unless;

- the test apparatus only emits X-ray radiation, and;
- the test area and source are in a completely sealed apparatus, and;
- The testing process is done automatically.

5.81.2 Radioactive materials shall not be stored on GE GPS sites, so far as is reasonably practicable. If it is not reasonably practicable, all appropriate licenses and authorizations must be granted by the adequate authorities before storing such materials on site.

5.81.3 Equipment emitting ionizing or X-ray radiation shall be handled and used in accordance with all applicable regulations, by qualified personnel.

5.81.4 Radioactive materials must never be handled directly, but only in their specifically designed and protected shielded container. If a vehicle or trolley is used to move the container, the container must be securely fastened to the vehicle or trolley.

5.81.5 On Project sites, equipment emitting ionizing or X-ray radiation shall only be used by specialized sub-contractors.

5.81.6 So far as is reasonably practicable, activities using ionizing or X-ray radiation shall be scheduled during the Site's non-working hours.

5.81.7 Restricted Zones where access is restricted to a limited number of persons, including operators of the equipment emitting ionizing or X-ray radiation, must be identified and barricaded using Hard-barriers, during the execution of the concerned activities. When defining Restricted Zones, particular care shall be given to identify whether a risk exists for persons located at levels below or above the location where the ionizing and X-ray radiation are emitted.

5.81.8 All personnel authorized to access Restricted Zones must be listed on one or more high-control Permit(s) to Work. No other personnel than those listed on the Permits to Work may be authorized to access Restricted Zones.

5.81.9 Personnel authorized to access Restricted Zones must be specifically competent to do so.

5.81.10 All personnel authorized to access Restricted Zones must be subject to a strict monitoring of their exposure, in accordance with the applicable regulations, licenses and risk analysis (e.g. passive monitors).

5.81.11 A notification must be sent to all parties on site one day before the work activities using ionizing or X-ray radiation is performed. This notification must clearly identify the date, time and location of the tests and boundaries of Restricted Zones.

5.81.12 Prior to starting the activity requiring the emission of ionizing or X-ray radiation, the Restricted Zone must be evacuated and the Permit Holder must verify together with the Permit Issuer (or delegate) that the Restricted Zone is clear of unauthorized personnel and that all other control measures are implemented.

5.81.13 Prior to starting the activity requiring the emission of ionizing or X-ray radiation, all monitors and meters must be tested against a test source or exposure device to ensure they give an accurate reading.

5.81.14 Prior to starting the activity requiring the emission of ionizing or X-ray radiation, a test exposure shall be performed and dose rates measured at the boundaries of the Restricted Zone, to verify that the definition of this boundary is appropriate.



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- 5.81.15 During the activity requiring the emission of ionizing or X-ray radiation, watchmen must be in place at strategic locations around the boundary of the Restricted Zone, to prevent the entry of any unauthorized person.
- 5.81.16 Continuous monitoring of dose rates must be performed at strategic locations around the boundary of the Restricted Zone, to ensure that the radiation levels are not higher than the foreseen levels.
- 5.81.17 At the end of the test, the radioactive source shall be immediately returned to its shielded container, and X-ray apparatus disconnected.
- 5.81.18 Upon completion of the activity, the Permit Holder and competent operators shall survey the Restricted Zone to ensure that there is no remaining radioactive contamination.
- 5.81.19 In case of any incident, the activity involving the emission of ionizing or X-ray radiation must be stopped and the emergency response plan triggered. The activity shall not be resumed until an investigation has been undertaken to understand the causes of the incident and the appropriate corrective actions have been implemented.
- 5.81.20 For equipment emitting ionizing radiation, incidents include (but are not limited to):
- The source is stuck in the shielded container and cannot be operated;
  - The source is stuck outside of its shielded container (i.e. in or outside of the guide tube);
  - The source is lost;
  - Any shielding material (at the source or anywhere else) is damaged or displaced;
  - Doubt or deviation from the foreseen level of dose emission at the boundary of the Restricted Zone;
  - Unauthorized entry or presence of person(s) in the Restricted Zone.
- 5.81.21 For equipment emitting X-ray radiation, incidents include (but are not limited to):
- Unintentional emission of X-ray radiation (either early start-up / energization of the equipment or late termination of emission);
  - Improper / uncontrolled / abnormal emission of X-ray (pulsing, frequency, direction, etc.);
  - Any shielding material (at the source of emission or anywhere else) is damaged or displaced;
  - Doubt or deviation from the foreseen level of dose emission at the boundary of the Restricted Zone;
  - Unauthorized entry or presence of person(s) in the Restricted Zone.
- 5.81.22 The emergency response to incidents associated with ionizing radiation must include (but shall not be limited to):
- Evacuation of the area;
  - Collection of meters and personal dosimeters' readings;
  - Nobody to enter an area with unknown dose rate without an operating personal alarm monitor and / or direct reading dosimeter (not passive recording dosimeter);
  - Nobody to touch a radioactive source;
  - Immediately seek the assistance of competent external emergency services and qualified experts or source supplier;
  - Emergency equipment must include (but shall not be limited to): adequate and operational radiation meters (including personal alarm, direct reading and passive dosimeters), bags of lead shot, lead sheet, spare shielded container.
- 5.81.23 The emergency response to incidents associated with X-ray radiation must include (but shall not be limited to):
- De-energization of the X-ray apparatus by any means necessary;



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- Take note of the position, beam direction and exposure settings of the X-ray apparatus;
- Quarantine of the X-ray apparatus;
- Collection of meters and personal dosimeters' readings;
- Seek the assistance of competent external emergency services and qualified experts or apparatus supplier.

5.81.24 It is strictly forbidden to eat, drink, smoke or have any food, drinks, and smoking products in Restricted Zones and in areas where radioactive materials are stored.

**5.82 Radiation – non- ionizing radiation, ultra-violet and infra-red**

5.82.1 Sources of non-ionizing radiation include:

- Welding;
- Sunlight;
- Lasers.

5.82.2 Employers must identify the sources of visible, UV and IR radiation that may cause a risk for the health of persons.

5.82.3 Any equipment that emits UV radiation and the area where the equipment is located must have appropriate UV warning labels posted.

5.82.4 Appropriate training must be delivered to persons exposed to UV & IR radiation on its associated risks.

5.82.5 For persons operating in the presence of laser and welding activities, the following controls must be considered:

- Opaque screens;
- Visible, UV and IR radiation blocking filters and door interlocking power supplies;
- Job rotation;
- Suitable PPE (e.g. goggles with filter lens, welding gloves & clothes).

5.82.6 For persons exposed to UV radiation from sunlight, minimization techniques include:

- Avoiding the outdoors when the sun UV & IR radiation is at its most intense;
- Providing shade cover;
- Suitable PPE (E.g. wide brimmed hat, long sleeve shirt, pants, sunscreen, sunglasses etc.).

5.82.7 Outlined below is a UV Index (in accordance with the requirements of the World Health Organization, defined in the publication 'WHO/SDE/OEH/02.2 Global Solar UV Index, A Practical Guide') table which describes protection measures depending on the UV index of the site location.

Table 5: Standard protection measures against solar UV radiation

UV Index - Sunlight		
UV range	Risk	UV protection measures
11 +	Extreme	Prolonged exposure to extreme levels of UV radiation can pose serious health risks. Attempt to conduct work out of direct sunlight until UV Index levels decrease or really cover up. UV protective clothes and wide brimmed hat must be used along with sunglasses and sunscreen with a protection factor of 30. Seek shade when possible.
8 - 10.9	Very High	A wide brimmed hat shall be used to protect head, face, eyes, neck, and shoulders by creating shade. Legs and arms can be protected with UV protective clothing. Sunscreen with a protection factor 30 or more must be made available to all exposed employees and must be used on exposed skin



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UV Index - Sunlight		
UV range	Risk	UV protection measures
6 - 7.9	High	When the UV Index is 'high' there is a real possibility of skin or eye damage. Good UV protection should include sunglasses, a hat, sunscreen with a protection factor of 15 or more, and UV protective clothing.
3 - 5.9	Moderate	If the UV Index level is closer to low not much protection is needed. Otherwise, sunglasses, a hat, and sunscreen with a protection factor of 15 or more applied to exposed areas should provide adequate UV protection.
0 - 2.9	Low	When the UV Index is 'low' there is little risk of exposure. No particular protection is required.

**5.83 Radiation – non-ionizing – Electro-magnetic fields**

5.83.1 Sources of (significant) electro-magnetic fields include:

- Start-up Frequency Convertor;
- Generators;
- Transformers;
- Wireless data transmission and communication Devices.

5.83.2 Occupational exposure limits:

In the absence of local regulations, or in presence of less stringent regulations, the following can be considered as guidance to establish the occupational exposure limits to be applied on a GE GPS site:

Table 6: Guidance values for establishing OELs for electro-magnetic fields

Exposure group	Guidance value for OEL (assuming field frequency: 50 Hz)	
	Magnetic flux density Levels	Electric Fields levels
Specialized employees (Working in higher than normal EMF Environments)	1000 $\mu$ T	20 kV/m
General workers (2013/35/EU)	500 $\mu$ T	10 kV/m
Nearby areas including residential, schools and kindergartens (ICNIRP)	100 $\mu$ T	5 kV/m

5.83.3 No person with a pace maker shall enter an area on site where magnetic fields exceed 100  $\mu$ T. These areas must be clearly marked, in all appropriate languages.

5.83.4 The following hierarchy of control must be followed, in order to ensure exposure levels are below the occupational exposure limits:

- 1) choice of equipment emitting less electromagnetic fields,
- 2) Technical measures to reduce the emission of electromagnetic fields including shielding, interlocks, etc.,
- 3) Appropriate maintenance programs for work equipment, workplaces and workstation systems,
- 4) Limitation of the duration and of EMF exposure.

**5.84 Radiation – Radioactive material on a customer's site/facility.**

5.84.1 In some installations (i.e. during inspections or dismantling) GE staff or contractors have the potential to be exposed to Radioactive Sources housed within equipment for the purposes of measuring ash levels or burner efficiency etc. Such installations would be ESPs, Boiler fuel ignition areas or Rotor / Generator rotational speed sensing equipment.

5.84.2 Where our work involves access to such areas we shall request formal confirmation from the Client that:



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- 1) all such devices have been removed by Competent Specialists prior to the commencement of any removal or dismantling works, or
- 2) if the equipment must remain in situ, confirmation that all such equipment and locations have been suitably protected from physical damage and all means to prevent exposure to radiation have been taken

5.84.3 Where such equipment has to remain in situ, suitably protected, the Client shall confirm in writing what those precautions are and the exact locations of all such equipment

### 5.85 Resource conservation

5.85.1 Sites with more than 50 workers shall develop a transportation plan to minimize the usage of individual vehicles for commuting to and from work.

5.85.2 On Project-sites, the connection to the electrical grid shall be made as soon as possible to minimize the usage of diesel generators.

### 5.86 Sandblasting

The following hazards must be considered when undertaking sandblasting operations and the control measures to be applied are described in the associated section of this document:

- Pressurized work equipment (5.71);
- Substances dangerous to health (5.42);
- Projection of foreign bodies into the skin, face and eyes (5.63);
- Environmental concerns due to sand waste, potentially contaminated (5.1042, 5.1053, 5.1064, 5.1086);
- Noise (5.58, 5.59);
- Potentially hazardous atmosphere (5.35).

### 5.87 Scaffolds – General requirements

5.87.1 Scaffold material must be specifically designed for the purpose of scaffolding and shall conform to applicable local regulations and standards.

5.87.2 Scaffold structure elements and guardrails must be made of steel material.

5.87.3 Defective or damaged scaffold material shall be immediately put out-of-service and removed from the Site.

5.87.4 Scaffolds are intended only as a work platform and must not be used for long term storage and/or supporting other structures.

5.87.5 Work surface planks/boards shall be regularly cleared of rubbish, waste and surplus building material.

5.87.6 For scaffolds higher than 24 meters, or constructed in a manner that deviates from the scaffold manufacturer's specifications/standard design, a detailed assembly plan and calculation sheet shall be prepared and submitted to GE GPS to justify its stability and function, and a high control Permit to Work must be obtained.

5.87.7 For scaffolds of a height lower than or equal to 24 meters, and of a standard construction and function which conforms to the manufacturer's specifications and standard assembly plan, it is not necessary to provide a separate calculation sheet – the manufacturer's specifications and standard assembly plans shall be permanently available on Site. However, where any doubt exists as to the stability and function of the scaffold, the scaffold constructor shall supply a detailed assembly plan and calculation sheet before the scaffold will be approved for use.

5.87.8 Climbing guardrails and structure of the scaffold is strictly prohibited.





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5.87.9 Scaffolds must be tagged (e.g. "Scaff-tag") at each access point. These tags must include the following information:

- Whether the scaffold is safe for use or not (normally green = safe, red = do not use);
- Name of the scaffold erector (or erector company) and inspector;
- Proof of regular inspection;
- Maximum working load;
- Access restrictions (e.g. one specific company, or level of competency);
- Particular hazards.

5.87.10 Incomplete, defective or otherwise unsafe scaffolds must be marked as such at each access point, and access to them must be physically prevented, so far as is reasonably practicable.

5.87.11 It is strictly prohibited for anyone but competent scaffolders to alter a scaffold in any way.

5.87.12 All scaffolding must be inspected by a competent person after installation or assembly, after any event likely to have affected its stability e.g. following strong winds or alteration and as a minimum, every 7 days.

### 5.88 Scaffolds – Safe design of scaffolds

5.88.1 Scaffolds shall be designed and constructed in compliance with the requirements of 'EN 12811-1 Temporary Works Equipment – Part 1: Scaffolds – performance requirements and general design' or ANSI equivalent.

5.88.2 In addition to the above:

5.88.2.1 Materials used for scaffolding works must be certified to a recognized standard such as EN 12811-1 Scaffold Access & working platforms. Scaffold structure elements and guardrails must be made of steel aluminum or GRP (Glass Reinforced Plastic or Fiberglass) material. Wood or other organic material (e.g. bamboo) must not be used for scaffolding uprights and bracing.

5.88.2.2 Scaffolds shall be stable and be supported by hard-wood treads or other appropriate means under the scaffold base-plates.

5.88.2.3 Scaffolds shall have guardrails and toe-boards on all open sides and ends of platforms, in accordance with the requirements of 5.117.

5.88.2.4 Where a scaffold is placed next to a structure and does not have safety guard rails between the scaffold and the structure, the gap between the structure and the work surface must not exceed 20 cm.

5.88.2.5 When the scaffold is constructed along a wall or any other structure which does not extend beyond the work surface level by at least 90 cm, a guardrail must be installed along or on the opposite side of the wall or structure.

5.88.2.6 External access ladders may only be employed to access the first level of the scaffold from ground level to a maximum height of 2 meters. The step-off point from the ladder to the work surface shall be protected by a self-closing gate or equivalent means.

5.88.2.7 All accesses to levels of the scaffold over 2 meters from the ground level shall be internal.

5.88.2.8 Access ways through the scaffold work surfaces shall be protected with self-closing trap-doors or gates so far as is reasonably practicable. Should this not be reasonably practicable, guardrails and toe-boards complying with the requirements of 5.117 shall be installed on at least 3 sides of the opening, and one movable guardrail of a height of 1.10m shall be installed on the remaining side of the opening, to facilitate access / egress to / from the platform.

5.88.2.9 Where 2 scaffold planks overlap, both shall be supported on the ends where there are no overlaps, and the overlap length must be of at least 30 cm.

5.88.2.10 All scaffold planks must be attached so that they cannot skid away from their position.



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5.88.2.11 Scaffolds with heights higher than 4 times the width of their base must be securely tied-off to a fixed structure, or the width of their base must be extended using outriggers.

### 5.89 Scaffolds – erection, modification and dismantling

- 5.89.1 Scaffolds shall only be assembled, modified and dismantled by competent persons.
- 5.89.2 The scaffold manufacturer's specifications shall be respected at all times for the erection and use of the scaffold material.
- 5.89.3 All scaffold elements used to construct one scaffold shall be from the same manufacturer and of the same material type (e.g. same thickness and type of steel, etc.).
- 5.89.4 All materials used in the construction of scaffolds shall be free from defects and/or damage.
- 5.89.5 During the assembly, modification and dismantling of scaffolds, the work area must be clearly identified by signs and barriers to prevent unauthorized persons from entering the area and/or the scaffold.
- 5.89.6 Signs prohibiting access to the scaffold shall be clearly displayed at all the scaffold access points to avoid unauthorized use of the scaffold during its construction, modification, disassembly and before it has been approved as safe for use.
- 5.89.7 In addition, and so far as is reasonably practicable, access to scaffolds and working platforms during their construction, modification, disassembly and when they are not safe for use, should be prevented by physical means (e.g. Hard-barriers, netting).
- 5.89.8 Access ladders and stairways must be installed as early as is reasonably practicable during the construction process to minimize the need for the scaffolders to climb up the scaffolding components.
- 5.89.9 The planks/decking, guard rails and toe-boards must be put in position as each working level is completed.
- 5.89.10 Wherever required, scaffolds shall be anchored and secured during the assembly process. All components shall be anchored as soon as the structure reaches the points specified in the scaffold construction plan and/or calculation sheet. Scaffolds shall however never be anchored to trays, pipes, railings, or any other temporary or permanent structure not specifically designed to withstand the required horizontal force applied by the scaffold.
- 5.89.11 Grounding must be applied for all mobile structures including scaffolds, heras fencing, MEWPs etc. placed outside the building or attached to not grounded objects.

### 5.90 Scaffolds – rolling scaffolds

In addition to 'Scaffolds – General requirements for scaffolds' (5.87):

- 5.90.1 The surface area of the highest work platform shall not exceed 2 times the surface area of the base, and the scaffold shall be designed in such a way that a reasonably foreseeable load applied to the most extended point of the highest work platform would not lead to the scaffold tipping over.
- 5.90.2 Wheel brakes must be in the engaged position while the scaffold is in use.
- 5.90.3 It is strictly forbidden for personnel to remain on the scaffold while it is being repositioned or moved.

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### 5.91 Scaffolds – suspended scaffolds

Suspended scaffolds must not be confused with cantilevered scaffolds. Cantilevered scaffolds are subject to the minimum standards in 5.87 and 5.88.



Figure 22: Cantilevered scaffold on a ship. Picture by Brosen, CC BY-SA 3.0



Figure 23: workers on a suspended scaffold. Picture by Hourick at en.wikipedia.org, CC BY-SA 3.0

For suspended scaffolds, the General requirements for scaffolds' (5.87) apply and in addition, the following:

- 5.91.1 Suspended scaffolds shall be subject to the same controls as Suspended man-baskets (5.97).
- 5.91.2 All suspended scaffolds (powered or manually hoisted) must be equipped with a breaking device that engages automatically in case of uncontrolled or sudden movement.
- 5.91.3 Suspended scaffolds must be hoisted or supported with appropriate outrigger beams, hooks or tie-backs. These must be specifically designed and capable to withstand the designed load of the suspended scaffold and of its occupants (persons and material), with a reasonable safety factor.
- 5.91.4 Outrigger beams must be placed horizontally, securely attached to the horizontal surface or stabilized with counterweights.
- 5.91.5 When counterweights are used, they must be specifically designed for this use, and secured against accidental displacement.



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- 5.91.6 When the suspended scaffold can be horizontally displaced, stop blocks must be in place on the route of the support system to appropriately limit the range of movement of the scaffold.
- 5.91.7 An exclusion zone must be implemented underneath suspended scaffolds, to prevent the risk of injury due to falling objects.
- 5.91.8 Personnel inside the suspended scaffold shall use a full-body harness attached with a fall-arrest lanyard to a designed anchor point inside the suspended scaffold.

### 5.92 Site Infrastructure

- 5.92.1 Permanent and temporary electrical installations (including distribution boards) must be inspected by a competent person before being put into service for the first time, and annually thereafter.
- 5.92.2 Permanent and temporary electrical installations (including distribution boards) must be grounded, in accordance with applicable legislation and building codes.
- 5.92.3 Permanent and temporary electrical installations (including distribution boards) must be protected by Ground Fault Circuit Interrupters (GFCI, also referred to as Residual Current Devices – RCD) that must be installed on distribution boards, generators and transformers whenever the output voltage is equal or greater than 240 volts. GFCIs shall be rated for a sensitivity of 30 mA (for protection against electrical shock), with a maximum break-time of 0.3 seconds for this value of residual current.
- 5.92.4 Distribution boards, electrical cabinets and panels shall have means of electrical isolation located on the outside of the equipment, so far as is reasonably practicable. They must be protected by fuses or circuit breakers and a GFCI, must be earthed and must have lockable doors that remain locked at all times and may only be unlocked by authorized persons. Non-authorized persons shall only have access to plugs or switches placed outside of the cabinet/board.
- 5.92.5 The site must be connected to a source of fresh water, certified by a competent local authority to be safe for drinking.
- 5.92.6 The site must be connected to a network of waste water collection managed or supervised by a local competent authority, so far as is reasonably practicable. Should this not be reasonably practicable, the requirements of 5.109 must apply.

### 5.93 Smoking

- 5.93.1 Smoking is only authorized in designated areas, located outdoors and not within 6 meters of an entrance, window, or air intakes of a building.
- 5.93.2 Designated smoking areas must be fitted with a fire extinguisher of the appropriate type, and with ashtrays and waste bins of sufficient capacity and cleaned regularly.
- 5.93.3 Designated smoking areas must be sheltered against wind and rain.
- 5.93.4 “No smoking” signs, in line with the local regulation and written in English and the relevant languages so that they can be understood by the workforce must be clearly posted at all entrances of buildings and in the welfare areas.

### 5.94 Steel Erection

- 5.94.1 Please refer to the relevant section:
  - Work at Height (see 5.113);
  - Lifting Operations (5.49);
  - usage of Mobile-Elevated Work Platforms (see [5.112](#));
  - Any other high-risk activities as relevant.



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- 5.94.2 To prevent the fall of primary steel columns, temporary bracing shall be installed from the ground anchorage point during their erection.
- 5.94.3 Horizontal sections and angles must be installed as early as possible after the erection of columns.
- 5.94.4 Footing, piers and walls shall have sufficient strength to support loads imposed during steel erection.
- 5.94.5 Temporary flooring must be installed, so far as is reasonably practicable, during the erection of steel structures. Where temporary flooring is not practicable, and where scaffolds are not used, safety nets must be installed and maintained whenever the potential fall distance exceeds the maximum potential deflection span of the safety net in case of a fall.
- 5.94.6 Unfinished bolting or welding above the foundation or uppermost permanently secured structure, except where the structural integrity is maintained, shall not exceed more than 4 floors or 15 m, whichever is less.

### 5.95 Stop Work

- 5.95.1 Employees, contractors, and visitors are authorized and expected to Stop Work, or decline to perform an assigned task, whenever an actual or perceived imminent concern for safety, the environment, or property exists.
- 5.95.2 Management & Operations Leadership shall fully support & promote the necessary culture to encourage and support the Stop Work Expectation. Retaliation against employees, contractors or visitors to exercise this authority even if, upon investigation the Stop Work situation was deemed unnecessary, shall not be tolerated.
- 5.95.3 Employees, contractors, and visitors are encouraged to have a questioning attitude:
  - 1. Do you understand the scope of work and task(s) being performed?
  - 2. Do you have all equipment and PPE needed to safely perform the task(s)?
  - 3. Are you competent/trained to perform the task(s)?
  - 4. Are you confident performing the task(s)?
  - 5. Is there anything you or others are doing that doesn't seem right or OK to you?
  - 6. Is anything preventing you or someone else from following established safety procedures?
- 5.95.4 Until the Stop Work situation is brought to a safe condition, work shall be stopped (leaving equipment and tools in a safe status):
  - 1. Notification shall be made immediately to Operational Manager and/or EHS representative.
  - 2. Work shall not resume until risks to people and/or the environment have been assessed, appropriate corrections/defenses have implemented and verified.
- 5.95.5 If opinions differ regarding the validity of a Stop Work intervention or the decision to resume work, and the conflict is not resolved the matter shall be escalated through the operation, then region and/or Business Division level, and if still not resolved then ultimately the matter shall be elevated to the Business EHS Leader.
- 5.95.6 If a condition observed can be immediately corrected by the individual, does not require action by the facilities/maintenance team, and can be verifiably carried on as a safe activity, the work may resume and does not need to be suspended.



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GPSPE CC EHS 010  
Rev: 2.05.96 Sulphur Hexafluoride (SF<sub>6</sub>)

5.96.1 The work on SF<sub>6</sub> pressurised equipment must be performed by qualified operational staff. (e-learning SF<sub>6</sub> Emission Impact Awareness (EIA) or SF<sub>6</sub> Emission Impact Prevention (EIP))

## 5.96.2 Labelling

5.96.2.1 All containers must be clearly labelled to identify their content with the following information: - Name of the chemical - Pictogram - Signal Word - Environmental warning: Contains fluorinated greenhouse gases covered by the Kyoto protocol - Hazard statements H - Precautionary statements P

5.96.2.2 Containers must be different colours to identify the type of SF<sub>6</sub> as per the table below

Gas	Colour of the bottle	Content	Pictogram	Signal Word	Hazard statements H	Precautionary statements P
New/pure SF <sub>6</sub>	Green	Sulphur hexafluoride		WARNING	Contains fluorinated greenhouse gases covered by the Kyoto protocol H280: Contains gas under pressure; may explode if heated	P410+P403: Protect from sunlight. Store in well-ventilated place
Used SF <sub>6</sub>	Orange Yellow	Sulphur hexafluoride, carbon tetrafluoride or air or nitrogen		WARNING	Contains fluorinated greenhouse gases covered by the Kyoto protocol H280: Contains gas under pressure; may explode if heated	P410+P403: Protect from sunlight. Store in well-ventilated place
Contaminated SF <sub>6</sub>	Orange Yellow	Sulphur hexafluoride, hydrogen fluoride, sulfur dioxide, thionyl fluoride		DANGER	Contains fluorinated greenhouse gases covered by the Kyoto protocol H280: Contains gas under pressure; may explode if heated H331: toxic if inhaled H302: Harmful if swallowed H312: Harmful in contact with skin H315: Causes skin irritation H319: Causes serious eye irritation H335: May cause respiratory irritation	P261: Avoid breathing dust/fume/gas/mist/vapours/spray P280: Wear protective gloves/protective clothing/eye protection/face protection P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P302+P352: IF ON SKIN: Wash with plenty of soap and water. P309+P311: IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician. P410+P403: Protect from sunlight. Store in well-ventilated place

## 5.96.3 Health precautions

5.96.3.1 SF<sub>6</sub> is a chemical product and precautions must be taken:

- Do not smoke – the heat of the cigarette will decompose the SF<sub>6</sub>.
- Do not eat or drink or store food and drinks in the vicinity.
- Avoid direct contact by using appropriate PPE.
- Ventilate the work area before working with any heat source.
- Ensure adequate oxygen levels to avoid asphyxiation and/or poisonous gas.

## 5.96.3.2 Asphyxia risk

SF<sub>6</sub> is heavier than air, therefore there is a risk of asphyxiation due to lack of oxygen if it accumulates where people work. It is strictly forbidden to work alone in a confined space where SF<sub>6</sub> is present. Safety precautions should be implemented including:

- Operators shall work in well ventilated areas.



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- Use of SF6 gas monitoring alarms, located where SF6 gas could accumulate in permanent installations (also during installation/erection if technically possible). The oxygen content in the working environment should also be checked.
- Strategy for evacuating SF6 gas from accumulation locations.

### 5.96.4 Contaminated SF6 Gas

5.96.4.1 Work on contaminated SF6 must be performed by a qualified person with appropriate certification (Contaminated Emission Impact Prevention (CEIP))

5.96.4.2 Under fault conditions, significant quantities of other sulphur-fluorine gases and metal fluorides can be produced which can be toxic, or highly toxic and corrosive. Where activities have the potential to expose operatives to one or more of the following gases (e.g., opening of a GIB section after flashover), consideration shall be given to the exposure limits detailed in the tables below.

#### Workplace Exposure Limit (WEL) Values

Substance	Long-term exposure limit (8-hour TWA)		Short-term exposure limit (15 min reference period)		Reference
	ppm (mg substance / Kg air)	mg substance / m3 air	ppm (mg substance / Kg air)	mg substance / m3 air	
Hydrogen Fluoride (HF)	1.8	1.5	3.0	2.5	1
Sulphur Hexafluoride (SF <sub>6</sub> )	1,000	6,070	1,250	7,590	1
Sulphur Dioxide (SO <sub>2</sub> )	WEL value removed from EH40 by HSE in 2003. See ' <b>Sulphur Dioxide Published Emergency Response Guidelines</b> ' tables below for guidance exposure limit values.				

#### Reference

1. HSE Guidance document EH40/2005 'Workplace Exposure Limits (2<sup>nd</sup> Edition, 2011)





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Rev: 2.0**Sulphur Dioxide Threshold Toxicity Values**

EXPOSURE VIA INHALATION		
ppm (mg SO <sub>2</sub> / Kg air)	mg SO <sub>2</sub> / m <sup>3</sup> air	Symptoms
0.1	0.26	Bronchoconstriction after 10 mins (especially in people suffering from asthma)
0.3 - 1	0.8 – 2.6	Noticeable odour or taste
26 - 52	10 - 20	Mild nasal symptoms
6	15	Nose and throat irritation
8 - 12	21 - 31	Throat and conjunctival irritation and lacrimation
50	131	Severe irritation
100	262	Adverse health effects or endangers life
400 - 500	1048 - 1310	Immediately dangerous to life and health; suffocation, airway obstruction, respiratory paralysis, shock.

References (a,b)

- 5.96.4.3 If there is a potential for operatives to be exposed to one or more of the above gases, a risk assessment shall be conducted and be in place before any work commences. The risk assessment shall detail the control measures required, as well as the method statement to be adopted.

**5.97 Testing of High Voltage Equipment**

- 5.97.1 When any High Voltage Equipment is to be subjected to test voltage, the Person responsible for the testing must ensure that the associated test equipment, leads and connections are of adequate strength/capability and are suitably insulated/guarded to prevent damage and accidental contact.
- 5.97.2 A risk Assessment must be completed before the HV test by the test engineer
- 5.97.3 A formal programme of commissioning operations must be produced to indicate the sequential order of switching/commissioning activities to energise and de-energise High Voltage Test Equipment/areas on site.

**High Voltage Test Equipment**

- 5.97.4 Where possible, test equipment purchased must conform to IEC/EN 61010 (Safety requirements for electrical equipment for measurement, control, and laboratory use). In house built test equipment must be designed and constructed to the same standards of safety as purchased test equipment.
- 5.97.5 Dedicated test instruments or purpose-built testing boards must have clearly identifiable shrouded plugin terminations. Test equipment shall be inspected by the user for visible defects, current calibration/valid current certification on each occasion prior to use.
- 5.97.6 If any equipment is found to be faulty prior to use, it must be labelled defective, removed from service and quarantined.



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- 5.97.7 The test equipment and the apparatus/equipment to be tested, must be equipped with a safety pressure rupture device or safety valve.

### Demarcated Temporary HV Test Area

- 5.97.8 All Test area exclusion zones must be properly demarcated with temporary barriers with a designated access and exit point.
- 5.97.9 Danger signage must be placed around the perimeter of the equipment to be tested to prevent un-authorized access.
- 5.97.10 The size of the demarcated area will be determined by the safety distances and clearances needed from live components including the risk of the gas pressure equipment failure.
- 5.97.11 On customers sites whilst dielectric testing, the live section of the busbar must be isolated from the test section with 2 disconnecting switches (or bus-bar links) open, with the connection between the opened contact connected to the ground earth.

### Energisation of test supplies

- 5.97.12 Prior to energizing the area/unit, the work areas must be checked to confirm all personnel are outside of the test area.
- 5.97.13 All tests must be conducted in line with the relevant procedures, specifications, risk assessments and equipment operating instructions.
- 5.97.14 If during any electrical tests an unsafe act or condition occurs either with the product or personnel, the test shall be immediately terminated.
- 5.97.15 The equipment to be tested must connected to the main earth ground circuit
- 5.97.16 When testing is carried out where there is a risk of wet conditions, all low voltage equipment and terminations must be IP54 rated. If this is not the case the testing must be STOPPED.
- 5.97.17 On Power transformers, test engineers must consider the possibility of generating high voltages through test connections on high ratio transformers.
- 5.97.18 The test dielectric equipment must be connected to a ground earth connection.
- 5.97.19 Prior to making contact with Transformer/test connections, earthing must be applied to discharge any residual capacitive or inductive electrical charge from the applied test voltage.
- 5.97.20 The instruments voltage transformers installed on the equipment to be tested, must not be exposed to a voltage frequency above the manufacturer's rating.

### Entry into the Energised Test Area

- 5.97.21 Prior to any activity within an energised area the following controls must be in place:
- Any person entering the energized area must be formally authorized.
  - A Permit to Work must be completed and communicated prior to entry.
  - Safety Clearances must be maintained.
  - The Exclusion zone must be physically demarcated.
  - An Accompanying Safety Person must be assigned to observe the test engineer.
  - If modifications are needed, before altering test connections, all energy must be isolated with LOTO applied and ZERO energy verified.

### Rescue procedure



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- 5.97.22 An accompanying safety Person who is not directly involved in the work or test activity must have been instructed on how to disconnect the equipment being worked on from all supplies of electricity and how to switch off any test equipment or disconnect it from the supply.
- 5.97.23 The person must also be trained in electrical rescue protocols and have the necessary rescue equipment sufficiently rated to the voltage of the test activity.
- 5.97.24 The rescue equipment will include but not limited to:
- Rescue pole.
  - Rubber mat.
  - Rubber (insulated) gloves.

#### Completion of Testing

- 5.97.25 All Equipment, cables and capacitors must be safely discharged after the application of test voltages.
- 5.97.26 Prior to returning the tested equipment to service, all relevant documentation must be completed and customer informed testing completed.

#### 5.98 Transport of material – within the GE site

This includes the transport of material between any areas under the control of GE, including laydown and work areas.

- 5.98.1 See 'Interference with moving vehicles and pedestrians' (5.43).
- 5.98.2 Transport of material and equipment shall only be done with equipment / vehicles that are specifically designed for this purpose (e.g. trailers, forklift trucks, etc.).
- 5.98.3 Goods may only be bundled when they can themselves bear the stack compression loads without additional support, and when they do not bend or dent.
- 5.98.4 The use of wire, steel or textile strapping on their own is not permitted as this type of bundling is unable to keep a rigid shape.
- 5.98.5 Bundles of pipe sections, reinforcement steel bars or other material must be transported onto trailers fitted with side columns to prevent the load to fall.
- 5.98.6 All appropriate equipment necessary to enable the safe transportation of hazardous substances from storage areas to the point of use on site must be provided, such as:
- compressed gas cylinders must be secured and transported vertically within suitable transport frames.
  - drums and large containers of hazardous substances shall be transported on or within a bund (e.g. "spill pallet"), thereby containing any leakage.
  - Mobile bulk cutting fluid pumps (where the cutting fluid is already stored in the unit) shall be provided to ensure a minimal risk of spillage during replacement of cutting fluids.

#### 5.99 Transport of material – externally, from or to a GE site

- 5.99.1 Goods may only be bundled when they can themselves bear the stack compression loads without additional support, and when they do not bend or dent.
- 5.99.2 The use of wire, steel or textile strapping on their own is not permitted as this type of bundling is unable to keep a rigid shape.

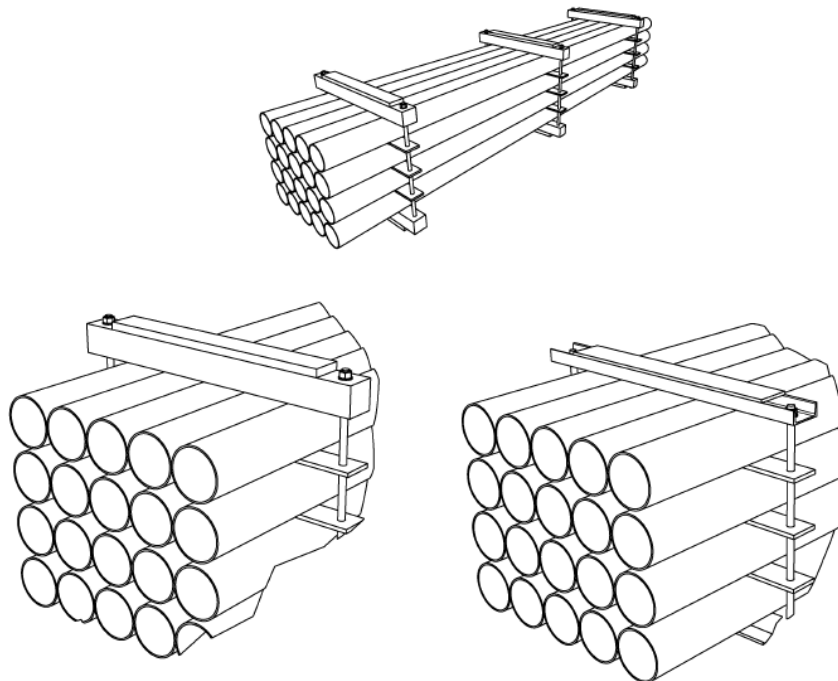




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- 5.99.3 Clamps of bolted timber or, for higher net weights, sectional steel clamps with timber inserts must be used (see Figure 24: Examples of safe stacking of pipe bundles).
- 5.99.4 Clamps must be firmly locked so that the goods cannot slide out of the bundle even if handled off-horizontal. This must be guaranteed even after repeated transshipment and prolonged storage.
- 5.99.5 A bundle must be held together by at least three clamps. The squared timbers/steel clamps used must be able to withstand expected loads. Timber/steel clamps (over the commodity width) must extend at least 10 cm on each side of the bundle. The thickness of the locking bolts must not be less than 12 mm in diameter.
- 5.99.6 Timber battens (for loading and stacking) must be nailed to the timber clamps or timber inserts between the locking bolts. The height must be sufficient to afford protection to the remaining locking bolts.
- 5.99.7 Intermediate layers, if required, must be made of weatherproof plywood.
- 5.99.8 Bundles of pipe sections, reinforcement steel bars or other material must be transported onto trailers fitted with side columns to prevent the load to fall.



Bundles having clamps made of squared timbers or sectional steel

Figure 24: Examples of safe stacking of pipe bundles

- 5.99.9 Lifting points of all packages must be marked with the chain symbol as per ISO 780:2016.
- 5.99.10 Items with a gross weight of 3 tons or more, or items with a center of gravity offset to the center line of the package from 20% or more of the size of the package, or items that are top-heavy, must be marked with a correctly placed symbol for the center of gravity in accordance with ISO 780:2106.



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Figure 25: "Center of gravity" symbol according to ISO 780:1999

### 5.100 Vibration

5.100.1 Employers shall assess and identify measures to eliminate or reduce risks from exposure to vibration so that employees are protected from risks to their health, in particular:

- Hand-arm vibration that comes from the use of hand-held power tools and that is the cause of significant ill health (painful and disabling disorders of the blood vessels, nerves and joints);
- Whole-body vibration that is transmitted through the seat or feet of employees who drive mobile machines, or other work vehicles, over rough and uneven surfaces as a main part of their job;
- Large shocks and jolts that may cause health risks including back-pain.

5.100.2 Vibration risk control measures must be implemented according to the following hierarchy:

- 1) **Alternative work methods** which eliminate or reduce exposure to vibration.
- 2) **Mechanize or automate the work**, for example: Use a breaker attachment on an excavating machine to break concrete rather than using a hand-held breaker.
- 3) **Equipment selection**: equipment is suitable (equipment that is unsuitable, too small or not powerful enough is likely to take much longer to complete the task and expose employees to vibration for longer than is necessary).
- 4) **Replacing old equipment** as far as is reasonably practicable with modern, efficient equipment more suitable for the work and of lower vibration output.
- 5) **Workstation design**: improve the design of workstations to minimize loads on employees' hands, wrists and arms caused by poor posture.
- 6) **Work schedules** that limit the time during which employees are exposed to vibration. Plan work to avoid individuals being exposed to vibration for long, continuous periods – several shorter periods is preferable.
- 7) **PPE**: provide employees with appropriate PPE. Gloves should not be relied upon to provide protection from vibration.

### 5.101 Vibration – Occupational Exposure limits

The following shall be considered as the occupational exposure limits to be applied on all GE sites:

Table 7: Vibration - Occupational Exposure Limits (Source: Directive 2002/44/EC)

	Action level ( $\text{m.s}^{-2}$ , for 8 hours exposure)	Maximum exposure level ( $\text{m.s}^{-2}$ , for 8 hours exposure)
"Hand and arm" vibration	2.5	5
"Whole body" vibration	0.5	1.15



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### 5.102 Visitors

- 5.102.1 At no times are visitors permitted to engage in any Site work activities.
- 5.102.2 All visitors shall successfully complete a GE EHS induction before entry to the Site.
- 5.102.3 Visitors shall be accompanied at all times while on the Site by a responsible person who shall ensure that they wear and use the mandatory PPE and comply with all EHS and security rules at all times.

### 5.103 Volatile Organic Compounds (VOCs)

- 5.103.1 Fixed facilities must consider the capture of VOCs in their production processes.
- 5.103.2 Water based paint must be considered in place of solvent-based paint.
- 5.103.3 Substances containing VOCs shall be packaged in small quantities to minimize fugitive emissions.
- 5.103.4 Containers of VOC substances shall be closed immediately after usage.

### 5.104 Waste - identification

The following requirements are applicable to all parties working for or on behalf of GE and must be strictly implemented. It includes waste generated by sub-contractors.

- 5.104.1 All types of wastes generated at the site must be identified, in line with 5.104.2 and local regulations.
- 5.104.2 As a minimum, the following waste types must be segregated on site:
  - Bio-hazardous waste, i.e. waste which is contaminated with pathogens borne in human body fluids and parts pests and remnants, etc.;
  - Hazardous waste, i.e. any waste containing or contaminated with hazardous substances. This can include chemical substances residues, containers, contaminated tools (clothes, brushes ...);
  - General waste, i.e. waste that does not pose an immediate hazard or threat to health or to the environment, and includes domestic waste, building, demolition waste, business waste and inert waste;
  - Scrap metal, which must be separated between non-ferrous and ferrous;
  - If appropriate and dedicated collection, transportation and treatment methods exist, segregation can be extended to cardboard, paper, wood, metal, organic, etc.
- 5.104.3 Waste identification shall include, in addition to all applicable legal requirements, requirements for transportation, storage and waste storage areas.

### 5.105 Waste – collection and transport

- 5.105.1 The frequency of transportation of waste shall be kept to a minimum, with special care being taken for hazardous and bulk liquid waste.
- 5.105.2 Waste shall only be transported by qualified companies, in accordance with applicable legislation.
- 5.105.3 Waste skips must be closed or covered during transport to avoid waste or debris to fall or fly off.

### 5.106 Waste - storage

- 5.106.1 All waste must be stored on identified areas, located outdoors, at least 10 meters away from building and perimeter fencing.



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- 5.106.2 Waste storage facilities must be secured against rummage and arson, fitted with side screens / walls and roofs, and concrete floors. Concrete floors in waste storage areas must be impervious, appropriately bunded to prevent any environmental impact.
- 5.106.3 Whenever waste is stored in skips, they must be fitted with lockable lids.
- 5.106.4 Requirements applicable to Hazardous substance storage (section 5.38) shall be applicable for the storage of Hazardous waste.
- 5.106.5 No hazardous waste may be stored on site for a period of longer than 90 days.
- 5.106.6 No hazardous waste shall be stored on bare ground. All hazardous waste must be stored in an area provided with secondary containment.
- 5.106.7 Potentially contaminated ground or water should be considered and treated as hazardous waste. This may include water or ground in secondary containment.
- 5.106.8 Appropriate spill response kits shall be kept at hazardous waste storage areas (spill kits, bunds).
- 5.106.9 All waste storage areas must clearly identify the type of waste to be stored within the area.
- 5.106.10 All waste storage areas shall be kept clean and tidy.
- 5.106.11 Appropriate measures shall be taken to avoid the proliferation of pest and vermin (see 5.61), such as regular cleaning & washing of bins and areas, regular collection of waste, consideration for closed bins, pest control (see 5.62).
- 5.106.12 Waste shall be removed on a regular basis to avoid accumulation (situations where quantities stored are above designed capacities).

### 5.107 Waste – food waste

- 5.107.1 Food waste shall be collected regularly and kept in locked containers, to prevent the proliferation of pest.

### 5.108 Waste - disposal

- 5.108.1 As a minimum, waste shall be disposed of by qualified companies, in accordance with applicable legislation.
- 5.108.2 Whenever possible, the destination of waste leaving site shall be known.
- 5.108.3 Records of waste quantities disposed, carriers, and end disposal methods must be kept and archived on site.
- 5.108.4 It is strictly forbidden to burn waste on site.
- 5.108.5 It is strictly forbidden to remove waste from site without formal approval from GE GPS site management.
- 5.108.6 Re-usage and recycling of waste shall always be considered as preferred solution to waste disposal.
- 5.108.7 The removal, transport and disposal of waste must be done in strict compliance with local and international (whenever relevant) regulation.

### 5.109 Waste water and drains

- 5.109.1 Waste water shall not be released to the environment without documented evidence that the water is not harmful to the environment or hazardous waste according to local legislation.
- 5.109.2 If waste water is classified as hazardous waste as per local legislation, it must be managed as such.



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- 5.109.3 Chemical contamination, particle contamination, pH and temperature should be considered when analyzing waste water in order to determine if it is to be considered as hazardous waste.
- 5.109.4 Waste water release points shall be known, controlled and compliant with applicable legal requirements.
- 5.109.5 Suitable interceptors (e.g. oil, grit) shall be installed at relevant places on drain systems to prevent any uncontrolled release of hazardous substances or waste to the environment. They shall be regularly maintained in accordance with applicable requirements and the Sites Environmental Aspects and Impacts Analysis.
- 5.109.6 GE/partner shall make arrangements for the periodic emptying of the waste water/sewage collection tank. The location of the area designated for the temporary Site Accommodation/Welfare facilities is shown on the general site layout drawing.

### 5.110 Water conservation

- 5.110.1 The site must be equipped with at least one water meter to monitor the overall water consumption.
- 5.110.2 Toilets must be equipped with dual flush system, as far as reasonably practicable.
- 5.110.3 Water taps in restrooms must be push buttons, as far as reasonably practicable.
- 5.110.4 Water used for hydro-testing must be considered for re-usage, as far as reasonably practicable.
- 5.110.5 Re-usage of non-contaminated water shall be considered whenever possible.
- 5.110.6 The number of connections in water conveying systems, that are potential leakage sources, shall be minimized as far as reasonably practicable.
- 5.110.7 Temporary water hoses/pipes shall not be laid on roads or walkways; if not reasonably practicable, they shall be protected from damage.

### 5.111 Welfare – drinking water

- 5.111.1 The employer shall be responsible for providing fresh drinking water for its personnel in the immediate vicinity of the working areas to avoid any risk of dehydration, as far as reasonably practicable.
- 5.111.2 The minimum quantity of fresh drinking water supplied by the employer to its personnel shall be 1.5 liters per person per day.
- 5.111.3 The employer shall ensure that the water supply at its sanitary facilities such as toilets, showers, hand basins, dishwashing amenities, etc., is maintained to the general standard of potable water.
- 5.111.4 The employer shall inform its personnel that any water on the Site not specifically identified as drinkable shall be considered as not drinkable.
- 5.111.5 Sources of non-potable water must be clearly identified as such.

### 5.112 Welfare facilities

This section addresses the provision of welfare facilities at the workplace (food preparation, resting areas, toilets, changing rooms). It does not address temporary or permanent accommodation for GE Employees or Sub-contractors.

- 5.112.1 When planning welfare provision, consider:



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- The nature of the work to be carried out and the health risks associated with it. For example, consider the provision of showers if the project involves hazardous substances or very dirty work;
- the distance workers will have to travel to the welfare facilities;
- the duration of the work and number of different locations;
- the numbers of people who will use them;
- the cleaning and maintenance of the welfare facilities;
- Whether they need to be relocated during the construction phase.

5.112.2 So far as reasonably practicable, flushing toilets and running water, connected to mains water and drainage systems must be provided. If this is not possible, facilities with a built-in water supply and drainage tanks shall be used, so far as is reasonably practicable. Otherwise, portable chemical toilets shall be used.

5.112.3 An adequate number of toilets must be provided, at a reasonable distance from all personnel. The number needed will depend on the number of workers on site and the type of facilities provided. Portable toilets have a limited capacity and need regular emptying. The number of portable toilets needed depends on the number of persons and the frequency of emptying.

- At least 1 toilet for 7 persons shall be provided, and emptied once per week;
- Table 8 defines the facility requirements when fixed toilets are installed.

Table 8: Number of toilets required depending on the amount of users

(Source: Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance, HSE)

Number of toilets and washbasins for women only or mixed use				Number of toilets, urinals and washbasins for men only			
Number of users	Number of toilets	Number of washbasins	Number of users	Number of toilets	Number of urinals	Number of washbasins	
1-5	1	1	1-15	1	1	1	
6-25	2	2	16-30	2	1	2	
26-50	3	2	31-45	2	2	2	
51-75	4	3	46-60	3	2	3	
76-100	5	4	61-75	3	3	3	
Every 25 beyond 101	+1	+0.5	76-90	4	3	4	
			91-105	4	4	4	
			Every 30 beyond 106	+1	+1	+1	

5.112.4 Minimum site requirements for bathroom & toilet facilities:

- Sanitary waste disposal shall be provided in facilities used by female workers;
- To help the cleaning of facilities, walls and floors shall be tiled or covered in suitable waterproof material;
- Adequate supply of toilet paper;
- Facilities that are well lit and ventilated;
- Facilities with hot and cold running water;
- Enough soap or other washing agents;
- A basin large enough to wash hands and forearms if necessary;
- A means for drying hands, paper towels or a hot air dryer;
- Showers where necessary, particularly for dirty work.

5.112.5 A supply of drinking water shall be readily available:

- It shall be supplied directly from the mains, so far as is reasonably practicable;





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- If water is stored, it shall be protected from possible contamination and changed often enough to prevent it from becoming stale or contaminated;
- Where necessary, the drinking water supply shall be clearly marked to prevent it being confused with hazardous liquids or non-drinkable water;
- Cups or other drinking vessels shall be provided at the outlet, unless the water is supplied in an upward jet, which can be drunk easily (e.g. a drinking fountain).

5.112.6 Site shall have arrangements for securely storing personal clothing not worn on site and for protective clothing needed for site work.

5.112.7 Men and women shall be able to change their clothes separately.

- Dedicated lockers might be needed, although on smaller sites the site office may be a suitable storage area if it is kept secure;
- Where there is a risk of protective site clothing contaminating everyday clothing, items shall be stored separately;
- Provision shall be made to allow wet clothing to be dried;
- As a general rule clothing shall not be placed directly on heaters due to the risk of fire;
- If electrical heaters are used in changing / locker rooms, they shall be properly ventilated and, if possible, fitted with a high temperature cut-out device.

5.112.8 Rest facilities shall provide shelter from wind and rain.

- Rest facilities shall have adequate numbers of tables, seating, a means for heating water for drinks and for warming up food (e.g. a gas or electrical heating ring or microwave oven) and be adequately heated;
- Rest areas are not to be used to store plant, equipment or materials;
- Areas for taking food and drink shall be maintained in a clean and tidy fashion;
- Awareness information (posters) are displayed explaining the potential biological hazards present.

5.112.9 Canteens and restaurants must be certified by a 3<sup>rd</sup> party as compliant with all applicable regulations related to the cooking and serving of food to employees. In addition, they must be thoroughly cleaned every day, and their waste evacuated every day.

### 5.113 Work at Height – general requirements

5.113.1 All personnel assigned to work at height must be physically and medically fit to do so.

5.113.2 Collective fall prevention measures (e.g. safe working platform or scaffolds see 6 and 5.90) shall always be preferred, to individual fall prevention (e.g. fall restraint).

5.113.3 All platforms designed to provide safe access to workplaces at height, or to provide a safe work area, must be designed and constructed to bear the reasonably foreseeable loads on this surface, with a reasonable safety factor.

5.113.4 When collective fall protection measures are not possible to implement, individual protection, (i.e. a safety harness with a Fall-arrest lanyard, attached to appropriate anchorage points and lifelines designed for the purpose) is compulsory. Due consideration must be given to the provision of safety nets and the foreseeable injury severity likely to occur should an operator forget to clip on.

5.113.5 Wire rope clip installations such as Crosby Clips must be installed in accordance with the manufacturer's instructions. Note that a minimum of 3 saddles must always be fitted on the live side of the rope.





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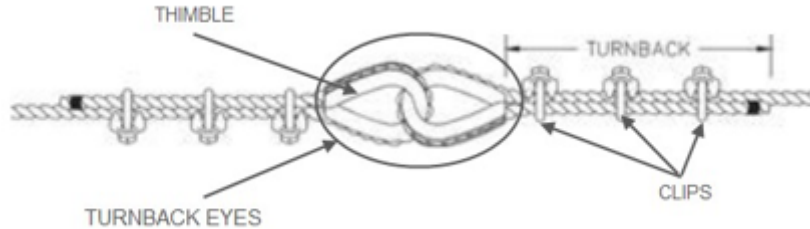


Figure 26: Wire rope clip installation

- 5.113.6 When practicable (and where the likelihood of error is high (i.e. failing to clip on), safety nets or other means must be installed to minimise the potential fall distance, thereby offering an additional line of defense.
- 5.113.7 Whenever collective or individual fall protection measures are used, an appropriate rescue plan must be in place before the start of work.
- 5.113.8 Safe access to and egress from, all work stations at height must be assured, including for emergency response. Stair towers shall be used in preference to ladders. All stairways must be large enough to permit 6 people carrying a stretcher to use the staircase safely, or a second means of access/egress must be provided.
- 5.113.9 Only one person can be attached to a vertical lifeline at a time.

### 5.114 Work at height - Mobile Elevating Working Platforms

- 5.114.1 The type of MEWP to be used must be selected to be suitable for its intended use, considering the ground conditions (e.g. scissor lift must not be used on rough terrain) and the working needs (e.g. height to reach and number of operators required). This must include any travel within the work area.
- 5.114.2 The manufacturers' operating manual must be available at the workplace and strictly followed. Operators must at no time attempt to operate outside the recommended limits.
- 5.114.3 A visual control of the MEWP must be done by the operator before use.
- 5.114.4 The man-basket of MEWPs must be fitted with an anchor point so that its occupants can attach themselves to it. The anchor point must be designed to withstand the dynamic force of the maximum number of persons allowed in the basket falling from it at the same time.
- 5.114.5 MEWPs must be fitted with guardrails and toe-boards in accordance with the requirements below:
- doors open inward
  - a top guardrail at  $h = 1100 \pm 100$  mm,
  - an intermediate guardrail at  $h/2 \pm 50$ mm,
  - a toe board at least 150 mm high. The gap between the toe board and the working surface (where the workers stand) should not exceed 10 mm
- 5.114.6 MEWPs shall be equipped with an automatic overload warning signal and an inclination sensor and indicator while in operation.
- 5.114.7 MEWPs shall be fitted with a set of controls accessible at all times from the ground level.
- 5.114.8 MEWPs shall be fitted with emergency stop controls on all control panels.
- 5.114.9 As part of the rescue plan for MEWPs usage, there must be in proximity of MEWP operation a nominated responsible person(s) who has been shown how to use the emergency lowering system from ground level.



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- 5.114.10 Personnel inside the MEWP shall wear a full-body harness with a fall-restraint lanyard, appropriately attached to a manufacturer's designated anchor point at all times.
- 5.114.11 All works must be performed from the inside of the MEWP platform. Operators must never leave the machine at height unless there's no other possible safe way of doing the job, in which case this must be considered as a non-routine high-risk activity subject to PTW and a double-lanyard system must be used.
- 5.114.12 Soft ground must be levelled, ballasted, and compacted to ensure it provides the sufficient load bearing capacity to withstand the weight of the MEWP and occupants.
- 5.114.13 Outriggers must be used whenever available on the MEWP, they must be extended fully on both sides of the MEWP and be laid on steel plates of sufficient thickness and surface area to spread the load.
- 5.114.14 A suitable exclusion zone must be implemented around the MEWP and be clearly indicated with Hard-barriers and warning signs, with a qualified banksman in place to guide the operator and prevent other personnel from entering its work area, to control the risks of collisions with persons and falling objects. The banksman shall possess a valid operator permit and a written authorization from their employer to operate the MEWP to be able to safely operate it from the ground level controls if needed.
- 5.114.15 MEWPs shall be operated only on firm surfaces of a maximum inclination as prescribed by the manufacturer.
- 5.114.16 MEWPs shall not be used during thunderstorms and/or when the wind speed exceeds 14 m/s at the work height. If the MEWP is not equipped with a wind speed measuring device, the operator must check such speed at the working height by means of a hand-held wind meter.
- 5.114.17 MEWPs shall not be used as an elevator to transfer personnel or material to other working platforms or levels.
- 5.114.18 Climbing out of the designed man-basket is strictly prohibited.
- 5.114.19 The use of non-integrated working platforms mounted on forklift trucks is strictly forbidden.

### 5.115 Work at height - Crane-suspended man-baskets

- 5.115.1 Man-baskets suspended from cranes may only be used where all other reasonable measures have been considered and eliminated after a detailed risk analysis.
- 5.115.2 Man-baskets shall be considered as lifting accessories, and as such must comply with the requirements defined in [5.48](#).
- 5.115.3 Man-baskets must be fitted with a sliding or inward-opening gate, and be enclosed on all other sides. The level of fall prevention provided on all sides must comply with the requirements defined in 5.117, as a minimum.
- 5.115.4 If they are not attached directly to the crane hook, crane-suspended man-baskets shall be suspended with a minimum of four independent sets of lifting accessories, themselves attached to an intermediary device/accessory (e.g. ring), directly attached to the crane hook.
- 5.115.5 The crane-suspended man-basket, and all associated accessories must have all been certified together for the purpose of lifting personnel by an accredited third-party expert.
- 5.115.6 The crane-suspended man-basket and its associated accessories shall be kept together as one unit and not used for any other purpose.
- 5.115.7 Personnel inside the crane-suspended man-basket shall use a full-body harness attached with a fall-arrest lanyard to:
- The crane hook / attachment point when the man-basket does not have a roof using appropriate devices such as slings, retractable vertical lifelines, etc.;
  - A designed anchor point on the basket itself when it has a roof.



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- 5.115.8 Exception must be made to the requirement of using individual fall protection in crane-suspended man-baskets whenever personnel is lifted above water, in which case such personnel must wear Personal Floating Devices (see 5.1.1).
- 5.115.9 It is strictly forbidden to exit the man-basket while it is suspended.
- 5.115.10 The basket shall never be lowered in "free" mode (i.e. only using the weight of the basket to lower it), lowering must be powered by the crane's motor.
- 5.115.11 Descent/ascent speed shall not exceed 1.5 m/s.
- 5.115.12 The basket shall be clearly labelled with the Safe Working Load and maximum number of persons.
- 5.115.13 No operations should be undertaken when the wind speed is greater than 7 m/s.

### 5.116 Work at Height – Floor openings

- 5.116.1 Horizontal openings of a surface equal to or less than 1 square meter shall be covered with temporary coverings and visually highlighted (e.g. high-visibility stickers/tape, fluorescent paint), so far as is reasonably practicable.
- 5.116.2 Temporary coverings shall have equal loading capacity as the surrounding area (i.e. 5 kN/m<sup>2</sup> for openings in gratings) to be achieved by an appropriate plate thickness of wood or steel.
- 5.116.3 Temporary coverings shall have sufficient overlap - it must not be possible for the covering to fall into the opening that it is protecting.
- 5.116.4 Coverings shall be securely fixed and prevented from sliding, shifting, inadvertent removal and generating a trip or fall hazard.
- 5.116.5 Horizontal openings of a surface greater than 1 square meter and open ends of platforms or breaks in handrails etc., shall be fully protected with a rigid guardrail and toe-boards (see 5.117.5), so far as is reasonably practicable.
- 5.116.6 Gratings and/or base plates must be secured with the designed appropriate connections. When this cannot be guaranteed, it shall be considered that there is a Horizontal Opening that must be controlled in accordance with 5.116.1 or 5.116.5, so far as is reasonably practicable.
- 5.116.7 If horizontal openings cannot be protected in line with 5.116.1 and 5.116.5 (for instance when work is being performed through the opening such as installation of a pipeline), all persons present in an area where they could fall through the opening must wear a full-body harness attached to a designed anchor point at all times (see 5.118.6).

### 5.117 Work at Height – Guardrails

- 5.117.1 Guardrails shall be constructed from materials specifically intended for that purpose, i.e. scaffold material or a purpose-built fall prevention system. Timber structures may be used for guardrails, for all applications except in scaffolds.
- 5.117.2 It is strictly forbidden to use warning tape or chains as a means to prevent falls.
- 5.117.3 Guardrails must be integrated or fixed in a manner that is secure, rigid and with the capability of resisting an impact or a fall producing a minimum 1 kN of horizontal force, without breaking or giving way.
- 5.117.4 Where local Regulations do not exist, or are less stringent, guardrails must have an upper/top rail at a height of 42 inches, +/- 3 inches (1.07m, +/-0.08m), mid-rail 21 inches (0.53m) or approximate center of the top rail and walking surface, and a toe-board placed at the floor level, and offering protection of at least 15 cm in height.
- 5.117.5 Guardrails may be substituted by any other suitable means which provide equivalent protection (e.g. sheet pile extending 110 cm from the ground level).



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5.117.6 Guardrails shall not themselves create supplementary risks to workers, i.e. tripping hazards, exposed sharp edges or nails, etc.

### 5.118 Work at Height – Individual fall-prevention and fall-protection

When individual fall arrest or protection means are used, the following conditions must be applied:

5.118.1 Personnel required to work at height have a medical certificate confirming their aptitude to work at height.

5.118.2 Personnel required to use Individual fall-prevention or fall- protection, must receive theoretical and practical training for the correct and safe use of the equipment. Records of this training shall be maintained at the Site.

5.118.3 Individual fall-prevention and fall-protection equipment must be selected based on a risk assessment and it shall only be used and stored in accordance with the manufacturer's instructions and applicable EHS requirements.

5.118.4 All Individual fall-prevention and fall-protection equipment shall be maintained in serviceable condition in accordance with manufacturer instructions and with the Site-specific EHS Plan, with up to date verification documentation available at the Site.

5.118.5 Every person using Individual fall-prevention or fall- protection shall be attached to an anchor point at all times.

5.118.6 Anchor points must have a load capacity as per EN 795-2012 of no less than:

- Metallic anchor devices 1200 kg (12 kN) per person attached, and must be formally determined as safe for use by a competent person.
- Non-metallic anchor devices 1800 kg (18 kN) per person attached, and must be formally determined as safe for use by a competent person

The following may be considered as appropriate anchor points:

- A permanent structure or suitable features of a building (e.g. a steel beam around which an anchor sling is wrapped);
- An anchor device that is specifically design-made (e.g. an eyebolt installed on a beam clamp, a tripod, a cast-in eyebolt);
- A temporary structure or element specifically designed to prevent or protect against falls (e.g. lifeline, scaffold,);
- Other elements, temporary (e.g. portable ladders) or permanent (e.g. stacks, vents, piping, ductwork), may only be used if their minimum structural requirements have been determined to be safe and approved by a competent person.

5.118.7 Anchor points shall be positioned overhead, so far as is reasonably practicable.

5.118.8 Individual fall-protection systems must be designed and used in such a way that in case of a fall, the person would be caught in their fall before they reach the floor.

5.118.9 Particular care shall be taken when using shock absorbing lanyards for Individual fall-protection. The calculation of the safety distance shall consider the length of the lanyard with shock absorber deployed, the height of the worker, the height where the lanyard is attached, and a safety factor (see Figure 27).



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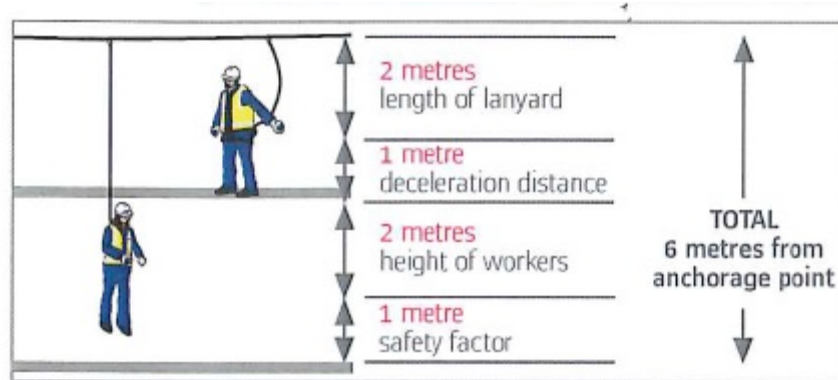


Figure 277: example of calculation of safety distance with a shock-absorbing lanyard

- 5.118.10 Vertical or horizontal lifelines may be used as anchor points for Individual fall-prevention and fall-protection systems, provided that they are installed by a competent certified person and verified by an accredited third-party expert.
- 5.118.11 Vertical lifelines must be used in conjunction with a Fall-restraint Lanyard attached to a suitable fall-arrest device, itself attached to the lifeline.
- 5.118.12 The installation of temporary lifelines must be such that the lifeline and anchorage device cannot be damaged (e.g. cut, burnt or abraded) during use and in case of a fall. Each lifeline installation must clearly display the maximum number of users at any one time. Temporary lifelines must be formally inspected by a competent person following erection and at least weekly thereafter, and after any incident, event or fall which may affect its strength and integrity. Evidence of weekly inspection must be made available at the lifeline access point.
- 5.118.13 Only one person may be attached to a vertical lifeline at a time.
- 5.118.14 Whenever individual fall protection is used, a rescue plan to recover suspended personnel in case of a fall must be prepared, prior to commencing the work. The plan shall ensure that rescue takes place rapidly to minimize the dangers of suspension trauma and loss of consciousness. Even though self-rescue may be possible, workers using a safety harness shall be supervised at all times.

### 5.119 Work at Height – working on roofs

- 5.119.1 General hazards associated with working at height must be controlled as described in the section 'Work at Height – general requirements' (see 5.1131).
- 5.119.2 Safe access to roofs shall be ensured prior to starting the work. This can include general access fixed or rolling scaffolds (see 5.876 and 5.90), mobile elevated working platforms (see [5.112](#)), ladders (see 5.44, 5.45, 5.46) and roof access hatches. Appropriate control measures must be implemented in accordance with the requirements of each appropriate section of this document.
- 5.119.3 A specific emergency rescue plan must be designed for working on roofs.
- 5.119.4 Appropriate lifting appliances must be used to make sure that materials and equipment are not carried at height by persons, and they must be designed and installed in such a way that persons fetching lifted materials at height do not expose themselves to a fall from height.
- 5.119.5 Waste-chutes or appropriate lifting operations must be implemented to safely remove waste from the roofs, during and at completion of the works.
- 5.119.6 Laying and handling of insulation, cladding or roofing material shall only be performed when the wind speed is lower than 10 m/s (7 m/s when ultra-light material such as glass fiber is used).





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- 5.119.7 Care shall be taken to minimize the risk of electrical arcing, when working on roofs near to exposed high-voltage conductors (see 5.60).
- 5.119.8 Permanent roofs must be designed and installed with fall prevention systems (see [5.116](#)).
- 5.119.9 Permanent sloped roofs must be designed and installed with roof ladders or crawling boards in addition to edge protection. Roof ladders or crawling boards must be:
- designed and fabricated to be fit for purpose;
  - strong enough to support workers when spanning across the supports for the roof covering;
  - long enough to span the support (at least three rafters);
  - Secure or placed to prevent accidental movement.
- 5.119.10 All roofs shall be considered as fragile until a competent person has confirmed that they are not.
- 5.119.11 The hierarchy of controls that must be followed for work on fragile roofs is:
- Work from underneath the roof using a suitable work platform;
  - Where this is not possible, consider remote works (e.g. using mast photography or videography) or using a MEWP that allows people to work from within the MEWP basket without standing on the roof itself (see [5.112](#));
  - If access onto the fragile roof cannot be avoided, perimeter edge protection must be installed and staging used to spread the load. Unless all the work and access is on staging or platforms that are fitted with guardrails (see 5.1175), safety nets must be installed underneath the roof (see 5.120) or individual fall protection (see 5.118) used; and
  - where harnesses are used they need adequate anchorage points (see 5.118)
- 5.119.12 Roofs must be inspected at the end of the working day to make sure that loose materials, especially sheets, offcuts and fixings, are not left unsecured on the roof.
- 5.119.13 Note: Some roof coverings can give a false sense of safety to those who are working on or passing by them. They can carry some distributed load, giving the impression that they can bear a person's weight, but they might not carry a concentrated load, such as the heel of someone walking or someone stumbling and falling. A stumble may cause the roof to fail instantly like a trap door. For example, asbestos cement and other non-reinforced fiber cement sheeting are liable to shatter without warning under a stumble. They also become more brittle with time.

### 5.120 Work at Height – Safety nets

Safety nets shall be considered for use during roofing works, and elsewhere where they might be practicable, to arrest the falls of personnel and/or objects, and used in accordance with the following requirements:

- 5.120.1 Safety nets and all associated equipment for attaching and joining the nets shall be of a professional purpose-built quality that conforms to all applicable regulation and standards.
- 5.120.2 Safety nets shall be only installed by competent persons.
- 5.120.3 Nets should be fitted as close to the working surface as possible, but must not exceed 2 meters below the work surface.
- 5.120.4 Safety nets shall be verified by an accredited third-party expert before use and be subject to any further inspections as per applicable regulations and standards.
- 5.120.5 Nets, supporting frames and anchorage points must be formally inspected by a competent person following erection and at least weekly thereafter, and after any incident, event or fall which may affect the strength or integrity of the net.
- 5.120.6 The appropriate type of net must be installed, depending on the results of a risk assessment:



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- Personnel nets with 100 mm mesh intended to catch a person from falling, or;
- Material or debris net with smaller mesh size (12 – 19 mm) intended to protect against falling objects.

### 5.120.7 Safety nets must be:

- Designed, tested and installed according to local standard or regulations;
- Installed by a competent person;
- Inspected and tested by a professional engineer or competent person under the engineer's supervision prior to first use.

## 5.121 Work at Height – prevention and protection against falling objects

### 5.121.1 Where any object may fall from height and cause injury, the following shall be considered by order of priority:

- 1) Eliminate the need to use that object at height.
- 2) Prevent the risk of the object falling: hand tools must be provided with a short strap/rope used to attach the hand tool to an appropriate anchor (user wrist, or in the case of heavy tools, a fixed point such as a guard rail), strict implementation of toe-boards on working platforms, persons wearing helmets with the chin strap attached.
- 3) Prevent injuries from a falling object, e.g. barricade the area below to keep personnel out of the potential drop zone, or erect safety nets (see 5.120), screens, panels extending from the edge of the platform or a guardrail system (see 5.1175) to reduce the likelihood of the falling object hitting a person or property on a lower level.

### 5.121.2 When objects are used at height all personnel are responsible to ensure that housekeeping and correct storage of materials are observed.

### 5.121.3 Unless specified otherwise by risk assessment a minimum safety distance of 2m per 10m elevation must be considered for the definition of hazardous areas for falling objects.

## 5.122 Working hours

### 5.122.1 Employee work hours shall not exceed any daily, weekly or monthly limits imposed by local law and all legal premiums must be paid for overtime worked. Where no working hours limits exist, workers will be given reasonable time off under the circumstances of the project and site schedules, to ensure the health, safety and physical/mental well-being of the employees. This should include as a minimum, 11 hours off each workday and one day off a week whenever possible.

### 5.122.2 Working hours may be reduced if the risk assessment identifies a risk of worker fatigue.

## 5.123 Working in extreme weather conditions - extremely hot temperatures

### 5.123.1 The risk levels for working in hot environments (whether they are due to climatic conditions or to the activities undertaken) shall consider the Dry-bulb temperature (measured in the shade) and the humidity level. The following table defines the Heat Index value for various combinations of Dry-bulb temperature and humidity.





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Table 9: Heat Index table

		Relative Humidity, %							
		< 30	30	40	50	60	70	80	90
Dry Bulb Temp, °C	50	54	>54	>54	>54	>54	>54	>54	>54
	49	54	>54	>54	>54	>54	>54	>54	>54
	48	53	>54	>54	>54	>54	>54	>54	>54
	47	51	>54	>54	>54	>54	>54	>54	>54
	46	50	>54	>54	>54	>54	>54	>54	>54
	45	49	54	>54	>54	>54	>54	>54	>54
	44	46	52	>54	>54	>54	>54	>54	>54
	43	45	49	>54	>54	>54	>54	>54	>54
	42	43	47	54	>54	>54	>54	>54	>54
	41	41	45	51	>54	>54	>54	>54	>54
	40	40	43	48	54	>54	>54	>54	>54
	39	39	41	46	52	>54	>54	>54	>54
	38	38	39	43	49	54	>54	>54	>54
	37	37	38	41	46	51	>54	>54	>54
	36	36	36	39	43	48	54	54	>54
	35	35	35	37	41	45	50	54	>54
	34	34	34	35	38	42	47	52	>54
	33	33	33	34	36	40	43	48	54
	32	32	32	32	34	37	40	44	49
	31	31	31	31	33	35	38	41	45
	30	30	30	30	31	33	35	38	41
	29	29	29	29	30	31	33	35	37
	28	28	28	28	28	29	31	32	34
	27	27	27	27	27	28	29	30	31
	26	26	26	26	27	27	27	28	28

5.123.2 The following table provides a description of heat-related health & safety risks associated with the Heat Index.

Table 10: H&amp;S Risks associated with Heat Index

Heat Index	Health & Safety Risks
≥ 54	Heat stroke imminent.
39 – 53	Heat exhaustion likely. Heatstroke possible with prolonged exposure and physical activity.
32 – 38	Heat exhaustion possible with prolonged exposure and physical activity.
27 – 31	Fatigue possible with prolonged exposure and/or physical activity.

5.123.3 The following must be considered as control measures to reduce the exposure to hot environments or to reduce the likelihood and severity that such exposures would result in injuries:

- Insulate heat sources;
- Shield heat sources;
- Provide good workplace ventilation;
- Provide cool refuges;
- Adapt the working hours to avoid working during the hottest hours of the day;
- Reduce the duration and / or frequency of tasks to be undertaken in the hot environment, and allow for frequent breaks (see Table 11: Recommended control measures to reduce the effect of heat);



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- Increase the quantity of fresh and cool (10 to 20°C) water per employee and per day and make it available in the immediate working area, so that any worker could drink 50 cL every 15 minutes while working (see Table 11: Recommended control measures to reduce the effect of heat);
- Acclimatization procedures to allow for a gradual physiological adaptation of the person to the change in temperatures (see Table 12: Recommendations for acclimatization to hot and cold environments).

Table 11: Recommended control measures to reduce the effect of heat

Heat Index	Work : Rest (minutes)	Water intake per person	Additional Controls
27 – 31	50 : 10	50 cL every 20 minutes	Continuous visual monitoring of workers in direct sun and heavy work.
32 – 38	40 : 10	50 cL every 20 minutes	No lone working (see 5.54).
39 – 53	30 : 10	50 cL every 15 minutes	Work under shade.
≥ 54	-	-	Consider stopping of work.

Table 12: Recommendations for acclimatization to hot and cold environments

Day	Acclimatization
1 <sup>st</sup>	20
2 <sup>nd</sup>	40
3 <sup>rd</sup>	60
4 <sup>th</sup>	80
5 <sup>th</sup>	100

- 5.123.4 Whenever there are sources of radiated hot temperatures (e.g. hot surfaces, furnaces) that may cause a risk to the health & safety of persons, the exposure of persons must be reduced by implementing adequate screens to reduce the amount of radiated energy, so far as is reasonably practicable. All control measures described in 5.123.3 must be considered. In addition, specific PPE may be provided to the exposed workers.
- 5.123.5 Training on identification of signs and symptoms of heat stress illness, including what to do in the event of an emergency;
- 5.123.6 A buddy is mandatory when working in extreme temperature conditions (working alone shall be prohibited).

### 5.124 Working in extreme weather conditions - extremely cold temperatures

- 5.124.1 The risk levels for working in cold environments (whether they are due to climatic conditions or to the activities undertaken) shall take into account the Dry-bulb temperature (measured in the shade) and the speed of wind. The following table defines the wind-chill temperature value for various combinations of dry-bulb temperature and wind speed, and associated level of risk. Wind-chill temperatures in the "cold" zone may cause the skin to freeze within 1 minute.



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Table 13: Wind-chill temperatures

		Air Temperature (Celsius)																
		0	-1	-2	-3	-4	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
Wind Speed (km/hr)	6	-2	-3	-4	-5	-7	-8	-14	-19	-25	-31	-37	-42	-48	-54	-60	-65	-71
	8	-3	-4	-5	-6	-7	-9	-14	-20	-26	-32	-38	-44	-50	-56	-61	-67	-73
	10	-3	-5	-6	-7	-8	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63	-69	-75
	15	-4	-6	-7	-8	-9	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66	-72	-78
	20	-5	-7	-8	-9	-10	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68	-75	-81
	25	-6	-7	-8	-10	-11	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70	-77	-83
	30	-6	-8	-9	-10	-12	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72	-78	-85
	35	-7	-8	-10	-11	-12	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73	-80	-86
	40	-7	-9	-10	-11	-13	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74	-81	-88
	45	-8	-9	-10	-12	-13	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75	-82	-89
	50	-8	-10	-11	-12	-14	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76	-83	-90
	55	-8	-10	-11	-13	-14	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77	-84	-91
	60	-9	-10	-12	-13	-14	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78	-85	-92
	65	-9	-10	-12	-13	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	70	-9	-11	-12	-14	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80	-87	-94
	75	-10	-11	-12	-14	-15	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80	-87	-94
	80	-10	-11	-13	-14	-15	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
85	-10	-11	-13	-14	-16	-17	-24	-31	-39	-46	-53	-60	-67	-74	-81	-89	-96	
90	-10	-12	-13	-15	-16	-17	-25	-32	-39	-46	-53	-61	-68	-75	-82	-89	-96	
95	-10	-12	-13	-15	-16	-18	-25	-32	-39	-47	-54	-61	-68	-75	-83	-90	-97	
100	-11	-12	-14	-15	-16	-18	-25	-32	-40	-47	-54	-61	-69	-76	-83	-90	-98	
105	-11	-12	-14	-15	-17	-18	-25	-33	-40	-47	-55	-62	-69	-76	-84	-91	-98	
110	-11	-12	-14	-15	-17	-18	-26	-33	-40	-48	-55	-62	-70	-77	-84	-91	-99	
		0 to -10 Low			-10 to -25 Moderate			-25 to -45 Cold			-45 to -59 Extreme			-60 Plus very Extreme				

5.124.2 The following must be considered as control measures to reduce the exposure to cold environments or to reduce the likelihood and severity that such exposures would result in injuries:

- Insulate cold sources;
- Shield cold sources and / or provide shelters to protect persons from the wind;
- Provide warm refuges;
- Adapt the working hours to avoid working during the coldest hours of the day;
- Reduce the duration and / or frequency of tasks to be undertaken in the cold environment, and allow for frequent breaks in warm refuges
- Provide warm beverages in the immediate vicinity of the work area, and in the sheltered areas and warm refuges);
- Acclimatization procedures to allow for a gradual physiological adaptation of the person to the change in temperatures (see Table 12: Recommendations for acclimatization to hot and cold environments);
- Provide persons exposed to cold working conditions with work clothing that protects as much as possible all exposed body parts. Protective clothing should be constituted of several layers of fabric, so far as is reasonably practicable and the outer layers must be of material that resist to wind and water, whenever relevant. Clothing must be kept dry and, whenever it gets wet, workers must be allowed to change to dry clothes immediately;
- Provide suitable additional PPE as relevant (e.g. gloves).

Table 14: Recommended control measures to reduce the effect of cold

Wind Chill Temperature (°C)	Maximum work Period	Number of Breaks
0° to -25°	Normal Breaks	
-26° to -34°	75 min.	2
-35° to -37°	55 min.	3
-38° to -39°	40 min.	4



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-40° to -42°	30 min.	5
-43° & below	Non-emergency work should cease	

- 5.124.3 Any PPE provided for protection against the cold shall not diminish the individual protection provided by other PPE.
- 5.124.4 The wind increases the effects of cold temperatures (wind chill). This must be especially taken into consideration for working at height.
- 5.124.5 Whenever there is a risk of frostbite by contact (i.e. direct contact of skin with very cold surfaces), for instance when using cryogenic fluids, the exposure of persons must be reduced by implementing adequate physical guards to prevent such contact, so far as is reasonably practicable. All control measures described in 5.123.3 must be considered. In addition, specific PPE may be provided to the exposed workers.
- 5.124.6 Training on identification of signs and symptoms of cold stress illness, including what to do in the event of an emergency;
- 5.124.7 A buddy is mandatory when working in extreme temperature conditions (working alone shall be prohibited).

### 5.125 Working in extreme weather conditions - lightning

- 5.125.1 When there is a significant probability of lightning strikes on site, the site must be equipped with a lightning / thunder detector, or other form of lightning forecasting tool, such as access to a professional lightning forecasting service. This shall trigger an alarm requiring all site personnel to take shelter whenever there are lightning strikes 5 km or less away. Shelter includes a substantial building or inside an enclosed, metal topped vehicle. Staff should:
- stay off corded phones, computers and other electrical equipment that is in direct contact with electricity
  - Stay away from windows and doors.
  - not lie on concrete floors or lean against concrete walls.

## 6. Quality records

None.

## 7. Responsibilities

The highest-ranking GE Manager directly responsible for the activities undertaken on site must ensure that this Directive and its requirements are communicated to all stakeholders, and that it is complied with at all times.

The responsibility to ensure that these requirements are implemented throughout all site activities is delegated to all managers and supervisors within the projects' organisation (Including Partners and Contractors). They shall ensure the requirements are fully understood, and are followed and actively supervised.

Product / System / Project Engineers are responsible to design products / systems that comply with the requirements set by this Directive.

Contractors are responsible to comply with the requirements set by this Directive whenever undertaking activities for or on behalf of GE GPS.

Deviations to any requirement set forth by this Directive shall be justified in writing, and formally approved by the highest-ranking GE Manager directly responsible for the activities undertaken and by the Tier 3 Business EHS Leader. Approval may be escalated, and not delegated.



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### 8. References

The following is a list of external regulation, standards and norms that are referenced to in this Directive. They do not constitute an overarching framework that this Directive complies with:

"Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards General Safety Requirements", GSR Part 3, published by the International Atomic Energy Agency.

"Security of Radioactive Sources", STI/PUB/1387, published by the International Atomic Energy Agency.

"Global Solar UV Index, A Practical Guide", WHO/SDE/OEH/02.2, published by the World Health Organization.

"ICNIRP Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)", published in: Health Physics 74 (4):494-522; 1998 by the International Commission on Non-Ionizing Radiation Protection.

Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration).

Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields).

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures.

"Chemical warehousing: The storage of packaged dangerous substances", HSG71, published in 2009 by Health and Safety Executive (HSE). ISBN: 9780717662371.

"Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance", L24 (second edition), published in 2013 by Health and Safety Executive (HSE). ISBN: 9780717665839.

EN 455-1 & EN 455-2 Medical gloves for single use

ISO 14122-4 Safety of machinery -- Permanent means of access to machinery -- Part 4: Fixed ladders.

ISO 780 Packaging — Distribution packaging — Graphical symbols for handling and storage of package.

EN 397:2012 Industrial Safety Helmets.

EN 812:2012 Industrial Bump Caps.

ISO 20345:2011 Personal protective equipment – Safety footwear.

EN 166:2001 Personal eye protection – specifications.

ISO 20471:2013 High visibility clothing – Test methods and requirements.

EN396:1994 Lifejackets and personal buoyancy aids.

ISO 12402-3 Personal flotation devices – Part 3: Lifejackets

IEC 60529 Degrees of protection provided by enclosures (IP Code).

EN 12811-1 Temporary Works Equipment – Part 1: Scaffolds – performance requirements and general design.

BS 857:1967 Specification for safety glass for land transport

GPSPE CC EHS 001 - *EHS Risk and Impact Management*

### 9. Appendices

None.



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### 10. Process management

Title / Role	Name of person in this position at time of publication	Reviewer or Approver
EHS Leader	A. Bionda	Reviewer
Global EHS & CC Leader	R. Bachmann	Approver

Process Owner : Andrea Bionda

QMS Representative: Eric Routurier

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