Contractor

HSSE Procedures Manual

Table of Contents

Incident Reporting and Stop Work Authority

genesisenergy	Procedure Title: **INCIDENT REPORTING & STOP WORK AUTHORITY**	Rev No: 0	Revised: 10/08/2020	Page: 1 OF 1

INCIDENT REPORTING

All incidents (such as; injuries, near misses, property damage, or spills) must be reported immediately to the Facility Manager/Supervisor.

STOP WORK AUTHORITY (SWA) AND ULTIMATE WORK AUTHORITY (UWA)

Each person at Genesis Energy, LP owned and operated facilities have Stop Work Authority (SWA), which gives the capability and obligation, without fear of reprisal, to immediately stop work that is creating an imminent risk or danger to personnel, equipment or the environment.

The following sequence should be followed when Stop Work Authority is initiated:

1) Stop – Stop the specific task(s) or activity that poses an imminent risk or danger in an orderly and safe manner. Announce to all affected personnel of your intent to delay or stop the job. You must stop all work when notified of a Stop Work.
2) Notify – Notify the job supervisor, UWA, or facility's operations management. The local Safety representative should also be notified. Suspend all work permits as applicable.
3) Correct – As applicable, you may be required to recommend and assist with corrective measures.
4) Document – the Facility Manager/Supervisor will ensure that all documentation is complete
5) Follow Up – individuals initiating Stop Work must agree with the Facility Manager/Supervisor that all safety concerns have been addressed and corrected.
6) Resume – Prior to resuming work you shall revise or revalidate your JSA and Safe Work Permits. The Facility Manager/Supervisor will be the final authorization before any work resumes.

0.02P-HSSE Principles

HSSE Principles

These Principles are intended to serve as guiding tenets of operational excellence and should be viewed as setting the standard for Genesis Energy performance.

All incidents and injuries are preventable.
We are intolerant of any level of incident or injury and have an obligation to send every employee home safely each day.

Working safely is a condition of employment.
All employees must hold themselves and others accountable to work safely. This is an expectation of all employees regardless of position.

Leadership is expected to role model safe behaviors.
All employees are expected to assume responsibility for safe behavior. However, those in leadership roles are expected to be leaders and role models for safe behavior.

All employees are expected to promptly stop and report unsafe acts and conditions that they observe.
This is a responsibility that must be acted upon with a sense of urgency and without fear of repercussion.

Safety excellence requires full presence of mind.
All employees must be continually vigilant in anticipating, understanding, and appropriately responding to safety risks both on, and off, the job in order to fully protect themselves and those around them.

HSSE is a value.
Safety and environmental protection are the foundational values of our business. No business objective is so important that it must be pursued at the expense of safety or the environment.

The Core Values of HSSE are the building blocks for our culture of safety and environmental protection. These values lay the foundation for every project, task, or operation and are the guiding principles to prevent risk of injury or harm to our employees and the environment.

Confined Space Entry (HSSE_03.1P)
Crane Operations (HSSE_05.3P)
Energy Isolation (HSSE_03.6P)
Fall Protection (HSSE_04.5P)
Hazard Identification (HSSE_03.13P)
Job Plan (HSSE_03.14P)
Personal Protective Equipment (HSSE_04.2P)
Preparation of Equipment and Systems for Maintenance and Repair (HSSE_03.12P)
Spill Prevention (HSSE_10.02P)
Vehicle Safety (HSSE_01.3P, Driver's Operations Handbook)

The Core Values of HSSE are part of the comprehensive HSSE Procedures Manual which provides the requirements for safe and environmentally sound work.

0.04P-HSSE Policy

Health, Safety, Security, and Environment (HSSE) Policy

At Genesis Energy, we believe that business performance and Health, Safety, Security, and Environmental ("HSSE") excellence go hand-in-hand. The intent of our HSSE Policy is to reinforce our commitment to HSSE principles. As such, no business objective is so important that it must be pursued at the expense of safety or the environment. Our operations create value for our customers, and our stakeholders, but these activities must be conducted in a sustainable and responsible manner. As such, we strive to operate our company in a manner that not only delivers superior business results, but also ensures compliance with applicable laws, regulations, and customer expectations.

This HSSE Policy and Genesis Energy's commitment to HSSE in the conduct of its business applies to all Genesis employees, contractors, subcontractors, suppliers, vendors, customers, visitors, and third parties conducting business with the company.

To implement our HSSE commitments, we:

- Expect all employees and representatives to comply with applicable HSSE laws and regulations.
- Engage employees through training and development to conduct their work in a safe and environmentally responsible manner, encouraging safe and healthy behaviors, both on and off the job.
- Design, operate, and maintain facilities with the goal of preventing injury, minimizing impact to the environment, and using natural resources and energy more efficiently.
- Manage our HSSE requirements through appropriate safety and environmental management systems.
- Evaluate and assess potential risks and hazards from our operations and proactively work to prevent or reduce impacts.
- Investigate, review, and report HSSE accidents or incidents to determine lessons learned and best practices in order to prevent recurrence.
- Maintain and test our emergency response procedures and plans to ensure effective responses to incidents resulting from our operations.
- Conduct appropriate audits, reviews, and evaluations of our operations to measure progress and drive continuous improvement.
- Track and regularly report key HSSE metrics and issues to Executive Management and the Board of Directors.

Grant E. Sims
Chief Executive Officer

Rev. 12/2024

01.2P-Contractor Pre-Bid Safety Information

1.2 Contractor Pre-Bid Safety Information Requirements

Purpose

This document outlines information required for submission by contractors for review and approval prior to the awarding of a contract to provide services or work to be performed for Genesis Energy, L.P. (GEL). This procedure also outlines contractor responsibilities and requirements for providing work or services for GEL.

Policy

All contractors or service providers shall submit information specified in this procedure in order to become an approved contractor for GEL. Contractors must provide all equipment necessary to complete the services or work contracted by GEL.

Scope

This applies to all contractors wishing to perform work or services for GEL.

General Information

Thorough documentation of the required information is crucial to the GEL contractor review process. Cost is only one of the deciding factors in the selection of a contractor. Consideration will be given to all the documentation gathered, with the balance between cost, safety performance history and other elements factored into the degree of risk associated with each contract. Contractors performing work for GEL are required to have an approved MSA and be members by ISNetworld unless an exception is granted by HSSE/Legal Department.

Procedure

Master Service Agreement
Any contractor performing work on Genesis Energy, L.P. (GEL) property must have an approved Master Service Agreement (MSA). The MSA will address the following items:

- Contract Document
- Time and Manner
- Items Supplies; Liens
- Contract Price; Billing
- Inspection
- Examination of Premises, etc.

- Compliance with Laws
- Insurance Requirements
- Indemnity
- Safety
- Termination
- Independent Contractor
- Non-assign ability and encumbrances
- Interpretation and integration
- Force Majeure
- Confidential Information
- Conflicts of Interest and Ethics
- Terms of Payment

Operator Qualifications for DOT Pipeline Covered Tasks
Contractors performing Operator Qualified (OQ) covered tasks to be qualified in each task by both written (test) and performance verification (PV). This two method qualification requirements will provide Genesis the ability to meet the current DOT requirements in accordance with 49 CFR 195.505(h) and 49 CFR 195.509.

Contractors performing OQ covered tasks shall be members of ISNetworld.

GEL Safety Requirements
Contractors are responsible for knowing and understanding all of GEL, local, state, and federal procedures that apply to the work or services being performed.

Safety and Environmental Training
Provide the extent, type and quality of safety, health and environmental training given to the contractor's employees.

Submit documentation that all employees have been adequately trained in safety, health and environmental responsibility, and have received OSHA required training relevant to their job.

Safe Work Practice/Skill Training Programs
The contractor shall submit an overview of their in-house "safe work" practices and craft skill training programs. Additionally, provide documentation of training or skill levels of each employee scheduled to be assigned to a GEL contract. As a minimum, the contractor's program shall include documentation of annual re-evaluation of the employee's skills.

The Proprietary Department shall notify Business Unit HSSE Representative (two weeks) prior to the contractor commencing work on GEL property.

Contractors utilizing subcontractors to satisfy obligations to GEL must ensure their subcontractors comply with all local, state, federal and GEL requirements.

Personal Protective Equipment
All types and quantities of Personal Protective Equipment (PPE) required by GEL shall be provided by the contractor. Contractors should be aware that all GEL operations PPE requirements include at a minimum, but are not limited to, safety glasses (ANSI Z-87 approved) with side shields, steel toed safety shoes or boots must be worn on-site and fire retardant clothing (FRCs) at all field locations. Additional PPE requirements shall be subject to site specific requirements.

Tools and Equipment
The type and quality of tools used on-site should be included with the pre-bid packet, along with a description of the tool and equipment inspection program utilized. Contractors are responsible for providing all tools necessary to complete contracted services.

Medical Assistance
Contractors should include information detailing medical assistance capabilities at the jobsite as well as off-site.

Safety/Environmental/Quality Management
The contractor should include a list of individuals with responsibility for safety, environmental and quality assurance on and off the job site. Also include proposed frequency of site visits, frequency of tailgate meetings and inspections by area or regional managers.

Safety Performance History
The contractor should submit the following information for the current year (YTD) and two years previous:

- OSHA 300 log
- Injury and Illness Incidence Rate
- Total Lost Workday Case Incidence Rate
- Lost Workday Incidence Rate
- Workers' Compensation "Experience Modification Rate" (EMR)
- Safety awards received at specific job sites or as a company and who issued the awards
- Safety performance history of any proposed site manager.

Employee Programs
A copy of the contractor's substance abuse policy and experience with drug and alcohol testing shall be provided.

Quality and Productivity Performance
The contractor must provide evidence of adhering to quality principles through presentation of the in-house training programs provided, certificates or awards received, partnership agreements with other companies, etc.

Following the award of a contract, the contractor must submit the following additional information prior to sending any employee on-site to perform work.

- Each contract employee, by name, that will work on-site.
- Each contract employee's training record or certification of skill level.
- Confirmation that the employee can understand verbal and written instructions in English.
- Confirmation that a security background check has failed to reveal information which would disqualify the employee from the prescribed job.
- Confirmation that the employee has been drug tested within the six-month period preceding the start of work on-site.

Documentation of the above shall be available for review by GEL upon request.

GEL has the right to refuse the service of individual contractor employees based on the information provided as well as based on the employee's performance on the job.

Contractor Performance / Work Site Audits
Contractor work and safety performance shall be evaluated by Facility or District Managers / Supervisors using *Section 3.9 Audit Procedure Appendix B – Contractor Field Audit*.

01.3P-Vehicle Safety

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors that operate a company-owned vehicle.

2.0 Purpose

To promote safe work practices that protect personnel when operating vehicles. A vehicle is any motorized piece of equipment which includes, but is not limited to: cars, trucks, tractors, forklifts, golf carts, ATVs, cranes, etc.

3.0 Procedure

NOTE:
For vehicle safety practices for tractor/trailer units, refer to the Driver's Operations Handbook.

3.1 Operating Company Motor Vehicles – General Requirements

3.1.1 Drivers must have a valid driver's license.

3.1.2 Company vehicles shall be used for business purposes only. Non-employees and non-business passengers (i.e. family and friends) are prohibited from riding in company vehicles.

3.1.3 A Post-Accident Drug and Alcohol test will be conducted for all accidents, in accordance with 07.3P – Drug and Alcohol Policy.

a. Employees that operate a vehicle for company purposes are considered a safety sensitive employee.

3.1.4 Drivers must safely operate vehicles in accordance with all applicable laws, including DOT requirements where applicable. Drivers shall be courteous to all pedestrians and other motorists.

3.1.5 Drivers of company vehicles must use good judgment and proceed at a pace suitable to conditions of the vehicle itself, the road, the traffic, and the weather.

3.1.6 Texting while driving is strictly prohibited while operating any motor vehicle.

3.1.7 Picking up hitchhikers is strictly prohibited.

3.1.8 Seat belts must be maintained in good operating condition and must be worn by all occupants at all times.

3.1.9 When entering third party facilities, vehicle operators should consult with facility personnel to obtain required permits.

3.1.10 When operating in areas of high grass, caution should be taken to ensure area below the vehicle is kept clear of high grass when parked.

3.1.11 Drivers must be sure the path is clear in the direction of travel before moving a vehicle.

3.1.12 Entering or exiting a motor vehicle while it is in motion is strictly prohibited.

3.1.13 Flammable products must not be carried inside passenger compartments.

a. Fire Extinguishers and appropriately marked sample containers may be carried in the cargo compartment of the vehicle.

3.1.14 Gasoline shall only be transported in approved safety cans and properly secured in the bed of the vehicle.

a. An approved safety can is a closed metal container, of not more than 5 gallons capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

CAUTION:

- **When filling a safety can:**
  - **Keep the container a safe distance from the vehicle.**
  - **Keep the nozzle in contact with the can during filling.**
  - **Only fill container about 95% to allow for expansion.**

3.1.15 To avoid carbon monoxide poisoning when using a heater inside a standing motor vehicle with its engine running:

a. Leave a vent or window open enough to ensure ample fresh air and open a door wide at intervals to prevent the accumulation of carbon monoxide fumes.

b. Park where the front of the vehicle is into the wind to allow for vapors to vent to atmosphere.

c. Vehicles shall not be left inside a building or enclosure with the engine running.

3.1.16 The Company will not pay or reimburse for fines for moving or non-moving violations of the applicable laws and regulations. All violations shall be reported immediately.

3.1.17 Employees shall not use a cell phone while driving. When “hands-free” device capability is not available, drivers will pull over a safe distance on the side of the roadway to safely handle incoming/outgoing calls.

3.1.18 Vehicles are prohibited in classified and process areas.

3.1.19 Do not leave vehicles idling inside operating facilities; turn off the ignition and leave the key in the vehicle.

3.1.20 The use, possession and distribution of illegal drugs, unauthorized weapons or explosives, in Company vehicles, or rental/personal vehicles while on Company business is prohibited.

3.1.21 The use of tobacco products, including smokeless tobacco and electronic cigarettes, is prohibited in Company vehicles.

3.1.22 Driving Under the Influence (DUI) as described by local, state or federal public safety laws, while on Company business (includes company, personal or rental vehicles) is strictly prohibited.

3.1.23 All company vehicles should be driven with the headlights on at all times.

3.1.24 Loose equipment, boxes and other materials carried inside vehicles must be secured in a manner to ensure items do not move around within the cab of the vehicle.

3.1.25 A vehicle shall not be operated if a driver feels fatigued or drowsy. Park in a safe location, stop the engine, lock the doors and rest.

3.1.26 The practice of truck bed passengers should be avoided. When no other means of transportation is available, the following will be utilized:

- At speeds at or below 10 mph, all riders/passengers in the back of pickup trucks must sit on the floor of the bed. Truck bed passengers are not allowed at speeds above 10mph or on public roads or highways.
- Do not sit on the side-rails of the bed or on the tailgate.
- In-plant trucks used to transport work crews may provide benches (where applicable) for employees/riders to sit while in transit.
- Ensure solid footing when entering or exiting a truck bed.

3.2 Defensive Driving

Defensive Driving is the technique used by the driver to minimize risk and avoid incidents by predicting the hazards surrounding the vehicle by driving alert.

3.2.1 Following these defensive driving tips can help reduce driving risks:

a. Maintain a safe following distance (minimum 3 second rule, count 1-1000, 2-1000, 3-1000 from a fixed point that the vehicle ahead passes and when your vehicle arrives at that same point).

b. Maintain safe stopping distance between vehicles (minimum 1 vehicle length, stop far enough back to see where the rear tires of the vehicle ahead touch the road).

c. Have a travel plan for the route to take and stopping points.

d. Don't depend on other drivers to always do the right thing or obey the law.

e. Don't engage with aggressive drivers.

f. Adjust your speed to the conditions of the road and not necessarily the posted speed limit.

g. Always plan to have an escape route for whatever might happen.

h. Separate driving risks to focus on one thing at a time and have a corrective action for each.

i. Take advantage of driving safety devices (lane assist, blind spot monitor, backup camera, collision avoidance system, etc.).

j. When in doubt, "yield".

k. Use your blinkers to signal your intentions early.

l. Monitor your blind spots.

m. Stay out of the other driver's blind spots.

n. Look as far ahead of your vehicle as possible to see hazards ahead of time.

o. Eliminate distractions to concentrate on what's important – driving safely.

3.3 Railroad Crossing Guidance

3.3.1 When approaching a railroad crossing in a vehicle, it's essential to adhere to specific procedures to ensure safety. Here are the standard guidelines for crossing railroad tracks:

a. Maintain focus on the road and your surroundings, watching for signs of an approaching train.

b. Always obey warning signs and signals, such as flashing lights, gates, and bells. Do not cross the tracks when these signals are active.

c. If there are no active warning signals, stop your vehicle at least 15 feet from the nearest rail when the tracks are clear. Look both ways for an approaching train before proceeding.

d. Never stop your vehicle on the tracks. If your vehicle stalls on the tracks or the traffic ahead is stopped, try to move off the tracks immediately. If a train is approaching, exit your vehicle and move away from the tracks.

e. Lower your windows and reduce in-vehicle noise to listen for an approaching train, which may be quieter than expected.

f. Even when no train is in sight or sound, look in both directions for an approaching train.

g. Only cross the tracks when you are sure there are no approaching trains. Wait until the tracks are entirely clear.

h. Cross the tracks at a reasonable speed when it is safe to do so, ensuring sufficient clearance.

i. Some crossings have multiple sets of tracks. Verify that all tracks are clear before proceeding.

j. If you have a manual transmission, make sure you are in the appropriate gear before reaching the tracks, as shifting gears while on the tracks can lead to stalling.

k. Trains cannot stop or swerve abruptly. Do not attempt to beat a train to a crossing. Always yield the right of way to trains.

l. If a white line is present before the tracks, stop your vehicle behind it.

m. At night, visibility is reduced, so ensure your vehicle's lights are on, and watch for train headlights.

n. If you encounter a crossing with malfunctioning signals or gates, report it to the appropriate authorities promptly.

3.4 Safe Parking and Departure

3.4.1 The following parking practices will be used by all personnel in order of priority based on the configuration of the parking lot/space:

a. Pull through so that the vehicle can depart pulling forward through the space.

b. If pulling through is not possible then back in so the vehicle can depart pulling forward from the space.

c. Only in situations where the parking configuration does not allow pull through or back in (i.e. angled or parallel parking) will pulling forward into a parking space be allowed.

3.5 360° Walk Around Inspection

3.5.1 Drivers are required to perform a 360° Walk Around Inspection prior to operating the vehicle.

3.5.2 Ensure the following when completing the 360° Walk Around Inspection:

a. Visually inspect vehicle for evidence of damage.

b. Tires do not have visible damage or excessive wear and are inflated to the proper operating pressure.

c. There are no low to the ground obstructions, such as walls, fire hydrants, landscaping, rocks, bikes, toys or other fixed objects.

d. There are no persons or animals behind or beneath the vehicle.

e. Loaded material or equipment is secure and there is no risk of it falling or striking another vehicle when in motion.

f. All storage compartments are closed.

g. All headlight and taillight assemblies are in good working condition.

h. Front, side, rear glass and mirrors are clean with good visibility.

i. Wipers are not cracked or damaged.

j. There is no evidence of a leak.

3.6 Safety and Emergency Equipment

The following emergency and safety devices are required as minimum equipment to be carried in Company vehicles and maintained in an operable condition at all times.

3.6.1 Company Vehicles for Field Operational Use

1 – Current Registration and Insurance Card

1 – First Aid Kit and related supplies

1 – ABC Fire Extinguisher (2.5 to 5 lb.)

1 – Vehicle Accident Kit

- Incident Report Form
- Exoneration Card
- Witness Statement Card
- Clip Board (small)
- Pen
- Yellow Chalk

1 – Safety Triangles

3.6.2 Facility/Area Managers may expand the list of required emergency and safety equipment in accordance with driver, geographical assignments and equipment exposure.

3.7 Maintenance, Service and Repairs

3.7.1 Company vehicles must be maintained in good mechanical condition at all times.

a. If the driver detects a mechanical defect or safety hazard in a Company vehicle, the employee must notify management to determine repair options.

3.7.2 Proper PPE must be worn when performing maintenance and servicing batteries.

3.7.3 Employees are responsible for maintaining their assigned vehicles in a safe and operable condition.

3.7.4 Windshields, door glasses, rear glasses and rear view mirrors on Company owned vehicles must be properly maintained at all times.

a. All glass must be kept clean and free of decals, etc. except where required by law or approved by management.

b. Windshields that have breaks, cracks or shattered spots that obscure vision must be repaired or replaced.

3.7.5 All vehicles shall be serviced in accordance with manufacturers' recommendations.

3.7.6 At least one wheel must be blocked and emergency brakes engaged before raising a car or truck with a jack.

a. Follow the manufacturer's instructions and keep hands, feet and body in the clear to avoid injury in case the jack falls.

CAUTION:

- **Never crawl under a vehicle raised by a bumper jack or any kind of support that could fail and allow the vehicle to fall.**

3.7.7 Cell phone use, smoking and open flames are not allowed in or around a motor vehicle during refueling and maintenance activities.

CAUTION:

- **DO NOT attempt to remove radiator cap until radiator has reached ambient temperature.**

3.7.8 Jump Starting a Vehicle

a. Before you attempt to jump start the vehicle, review the owner's manual and ensure both batteries are the same voltage.

b. Move the vehicles close together, but do not allow the vehicles to touch one another.

c. With both vehicles off and in park, connect the jumper cables in the following order:

1. Connect one red clamp to the positive (+) battery post of the weak/dead battery. Ensure the other end does not touch any part of the car's engine or body, as this may cause a dangerous spark.
2. Connect the other red clamp to the positive (+) post of the good battery.
3. Connect one black clamp to the negative (-) post of the good battery.
4. Carefully connect the other black clamp to a large metallic part of the vehicle's engine block. Never connect it to the negative (-) post of the weak/dead battery, as this may cause sparking, which could ignite battery gases.

d. Start the working vehicle and run it at idling speed for a few minutes. After letting it run, start the weak/dead vehicle. Once the weak/dead vehicle has started and is running, disconnect the jumper cables in the reverse order.

3.8 Towing Trailers

3.8.1 Ensure the vehicle is capable of handing the Gross Vehicle Weight Rating (GVWR) of the trailer.

3.8.2 Ensure each part of the hitch system is in good condition.

3.8.3 Ensure that the hitch/receiver, ball mount, coupler and safety chains or cables are sufficient for the loaded capacity of your trailer. Each component must be equal to or greater than the GVWR of the trailer.

3.8.4 Ensure that the ball mount is the correct size such that is matches the coupler for proper fit. Both the ball and the coupler should have the size noted directly on the part.

3.8.5 Ensure the ball mount is at the proper height to ensure your trailer is parallel to the ground when loaded and towed.

3.8.6 If not permanently affixed, attached your ball mount according the manufacturer's instructions.

3.8.7 Attach the coupler to the ball mount according to the manufacturer's instructions. Ensure coupler pin is utilized.

3.8.8 Attach the safety chains from your trailer to your tow vehicle.

- The chains should crisscross to form an X beneath the trailer tongue such that it would catch the tongue should the trailer disconnect from the tow vehicle.
- Each chain shall have a separate attachment point to the tow vehicle and shall be rated for the GVWR of the trailer.

3.8.9 Connect any pin connectors for lighting and, if applicable, brakes.

3.8.10 Ensure the trailer lights and electric breaks, if applicable, are in working order.

3.9 All Terrain Vehicles (ATVs) and Utility Terrain Vehicles (UTVs)

3.9.1 A pre-ride inspection shall be performed before operation, according to manufacturer's recommendations.

3.9.2 Operate and carry passengers according to the manufacturer's recommendations.

3.9.3 If provided, seat belts must be maintained in good operating condition and must be worn by all occupants at all times.

3.9.4 Proper Personal Protective Equipment (PPE) shall be worn, including FRCs, head and eye protection.

a. For ATVs, a DOT, SNELL or ANSI approved helmet with face shield and/or impact resistant goggles is required.

3.9.5 Properly secure all equipment carried on the ATV/UTV.

3.9.6 Utilize proper riding techniques to avoid vehicle overturns on hills, rough terrain and in turns.

3.9.7 Never operate the ATV/UTV at speeds too fast for your skills or driving conditions.

3.9.8 Never operate the ATV/UTV on hills steeper than 15 degrees.

4.0 References and Revisions

4.1 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
12/01/2017	All	Complete revision of Vehicle Safety procedure and forms.
09/28/2020	3.1 3.3 3.4 3.6 3.7	Clarification on the following: Driver's must have valid driver's license. Company vehicles shall be used for business purposes only. Post-Accident Drug & Alcohol Test requirements updated. Safety cans for transporting gasoline. DUI requirements updated. 360° Walk Around Inspection guidance updated. Safety & Emergency equipment updated. Requirement to have Vehicle Accident Kit in possession when traveling on company business. Towing Trailers Section Added ATV/UTV requirements combined and updated.
12/05/2023	1.0 2.0 3.0 3.2 3.3 3.4 3.6 3.7.6 3.8.7	Remove 'rental or privately' and 'for company business' from the scope. Add: A vehicle is any motorized piece of equipment which includes, but is not limited to: cars, trucks, tractors, forklifts, golf carts, ATVs, cranes, etc. Add Note: For vehicle safety practices for tractor/trailer units, refer to the Driver's Operations Handbook. Add defensive driving definition and techniques section Add railroad crossing guidance section Remove intro sentences Remove: All Genesis employees traveling on company business must have a Vehicle Accident Kit in their possession. Add: and emergency brakes engaged Add: ensure coupler pin is utilized.

03.1-Confined Space Entry

3.1 - CONFINED SPACE ENTRY

Revision History

This page documents the revisions over time to the SOP. The most recent iteration should be listed in the row space, with consecutive versions following.

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
11/1/16	All	Complete revision of GEN_HSSE_003.1P Rev. 6, June 2011
07/26/18	10	Section 5.2.11 added to include training record requirements.
07/26/18	19	Section 5.9.10 clarification for attendant duties added.
03/12/19	All	Added clarifications for external floating roof tank inspections and truck trailer inspections

1.0 Purpose & Scope

The purpose of this procedure is to establish Company standards and ensure compliance with applicable state and federal regulations. This procedure will provide guiding requirements to enable employees and contractors to safely enter confined spaces.

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors involved in confined space entry operations.

This procedure applies to all new and existing Company facilities/locations where there is the potential for entry into any confined space such as but not limited to: enclosed vessels, vessel skirts, tanks, manholes, bins, hoppers, vaults, pits, ducts, tunnels, pipes or pipe openings.

2.0 Policy

2.1 GEL employees or contractors shall not enter into any confined space until they have received training compliant with the requirements of this procedure.

2.2 This procedure also applies to any confined space entry into equipment (frac tanks, mud tanks, etc.) brought on site by a third party.

2.3 All entries shall be performed in accordance with this procedure and applicable state & federal requirements.

2.4 GEL employees will not perform permit-required confined space entry operations with the exception of tanker inspections at the Ruston maintenance facility, as outlined in Section 5.15.

2.5 GEL management will ensure efforts are made to eliminate or control potential hazards of all confined spaces.

2.6 For the purposes of contractors entering permit-required confined spaces at GEL facilities, GEL will act as a Host Employer.

3.0 Definitions

3.1 Acceptable Entry Conditions The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit -required confined space entry can safely enter into and work within the space.

3.2	**Authorized Attendant**	A trained person stationed outside of the permit-required confined space that has the primary responsibility of monitoring all activities in the confined space and for setting in motion emergency procedures if needed. The attendant may initiate rescue from the outside of the space but he/she is never allowed to enter the confined space unless relieved of responsibilities by another trained attendant.
3.3	**Authorized Representative**	A Company employee properly trained and authorized by the HSSE Manager/Coordinator to issue Confined Space Entry Permits. Authorized Representative may also include a trained Contractor Safety Representative. Training is required in the following areas: • Hazard recognition • Assessment of confined spaces • Atmospheric monitoring • Safe work and confined space permitting • Confined space entry requirements
3.4	**Affected Employee**	Personnel who enter a confined space for any reason or who support the activities of the entry.
3.5	**Authorized Entrant**	Personnel or worker authorized by Entry Supervisor that is allowed to enter the permit-required confined space.

3.6 Blanking or blinding: The absolute closure of piping, pipeline, or duct by the fastening of a solid plate (such as a spectacle or skillet blind) that completely covers the bore. The blank or blind will be capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

3.7 Confined Space Entry Entry occurs as soon as any part of the entrant's body breaks the plane of the opening into the confined space.

Entry includes, but is not limited to, tasks such as:

- entering storage tanks,
- entering excavations deeper than 4 feet,
- descents into Internal Floating Roofs (IFR) or External Floating Roofs (EFR),
- descents into dome roofs,
- descents into buried valve boxes,
- descents into buried electrical junction boxes, or
- trailer tank inspections or repairs.

3.8 Entry Supervisor Employee responsible for ensuring all aspects and criteria for entry into a permit-required confined space are addressed and met.

The person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry as required by 29 CFR 1910.146 & 1926.1200

- An Entry Supervisor also may serve as an Attendant or as an Authorized Entrant, as long as that person is trained and equipped as required by 29 CFR 1910.146 & 1926.1200 for each role he or she fills.
- The duties of Entry Supervisor may be passed from one trained individual to another during the course of an entry operation

3.9 Confined Space Entry Permit

The document that is provided by Genesis and posted at the confined space and which allows and controls entry into a confined space. This document contains a list of the safety requirements that must be completed prior to entry into the confined space. The Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) is valid only when used in conjunction with the Safe Work Permit (GEN_HSSE_003.8F).

3.10 Host Employer

An employer who arranges to have another employer (contractor) perform permit-required confined space entry operations.

3.11 Hazardous atmosphere

An atmosphere that may expose a worker to the risk of death, incapacitation, and impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:

- Flammable gas, vapors, or mist at a concentration that exceeds 10% of its Lower Explosive Limit (LEL).
- Airborne combustible dust at a concentration that meets or exceeds its Lower Flammability Limit (LFL), or that obscures vision at a distance of 5 feet.
- Atmospheric oxygen concentration below 19.5% or above 23.5%.
- Any toxic material or substance in concentrations above the Permissible Exposure Limit (PEL).

Note: At GEL, no confined space entry is allowed with an LEL above **0**%.

3.12 Immediately Dangerous to Life and Health (IDLH)

A toxic or oxygen deficient atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health. IDLH values are typically found on the Safety Data Sheet (SDS) for the substance and are usually expressed in parts per million (ppm).

Note: IDLH for H_2S is 100 ppm. IDLH for benzene is 500 ppm.

3.13	**Limited or Restricted Means for Entry or Exit**	Any space where an occupant must crawl, climb, twist, be constrained in a narrow opening, follow a lengthy path or otherwise exert unusual effort to enter or leave, or where the entrance may become sealed or secured against opening from inside.
3.14	**Other Affected Employees**	Works in an area where permit required defined spaces are present, while having no responsibility in the confined space entry process.
3.15	**Inerting**	The displacement of the atmosphere by a non-combustible gas (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible and oxygen deficient.
3.16	**Retrieval System**	The equipment used for non-entry rescue of persons from a permit-required confined space, which may include: • Retrieval line, • Full body harness, • Wristlets (if appropriate), • Lifting device.
3.17	**Response Time**	Time for the rescue service to receive notification, arrive at the scene, set up and be ready for entry.
3.18	**Supplied Air System**	A pressurized supply of breathing air not carried on the person. System consists of breathing air cylinders containing Grade D breathing air, manifolds, regulators, hoses, and respirators. The primary air supply remains outside of the area and the users attach their respirator face piece to the air supply via breathing air hoses. Supplied air systems must be connected to a five-minute escape pack, carried by the user.
3.19	**Safe Work Permit**	A permit that serves as a review mechanism and control point for general work, hot work and confined space activities. The Safe Work Permit outlines detailed procedures and provides a checklist to facilitate evaluation of safe work preparation. The Safe Work Permit work permit will be kept on file for a minimum of 2 years.

4.0 Roles and Responsibility

4.1 Vice Presidents

4.1.1 Provides direct oversight of departmental compliance with the confined space entry program ensuring employee accountability.

4.1.2 Provides adequate resources to ensure compliance with this procedure.

4.1.3 Ensures the appropriate level of evaluation is provided to review each employee-initiated Stop Work Authority request.

4.2 Business Directors and Managers

4.2.1 Ensures personnel under their direction maintain compliance with this procedure.

4.2.2 Ensures only trained employees are assigned confined space entry duties.

4.2.3 Ensures work performed in confined spaces are conducted in accordance with this procedure.

4.2.4 Ensures Entry Supervisors are adequately inspecting work in confined spaces to ensure adherence to this procedure.

4.2.5 Ensures Stop Work Authority requests are reviewed with Supervision, the Employee and the HSSE Department and results communicated upward to Vice Presidents and Directors.

4.3 Facility/Area Managers/Person in Charge (PIC)

4.3.1 Ensures Entry Supervisors are adequately inspecting work in confined spaces to ensure adherence to this procedure.

4.3.2 Ensures notification of confined space entry is made to the Regional HSSE Managers/Coordinators.

4.3.3 Ensures the initiation of the Safe Work Permit process.

4.3.4 Ensures verification of contractors training credentials.

4.3.5 Ensures the proper procedures for isolating all energy sources are followed prior to any confined space entry work being undertaken.

4.4 Employees and Facility Operators

4.4.1 Exercise the right and the responsibility to STOP ALL WORK if they perceive a situation is unsafe.

4.4.2 Ensure confined space entry procedures are followed.

4.4.3 Ensure completion of a Safe Work Permit (GEN_HSSE_003.8F) for any confined space entry work.

4.5 HSSE

4.5.1 Conducts periodic site inspections of active confined space entries.

4.5.2 Conducts audits to verify confined space entry program compliance.

4.5.3 Provide updates to the confined space program and as subject matter experts ensures guidance language that facilitates organizational compliance.

4.5.4 Provides direction in the selection and purchase of air monitoring and specialized entry equipment.

4.5.5 Provides or arranges training compliant with regulatory requirements and Company standards.

5.0 Procedures

5.1 Contractor/Vendor Selection

5.1.1 An adequately trained and qualified contractor will be obtained to perform any permit-required confined space entry operations, with the exception of Ruston Maintenance trailer tank inspections, as outlined in Section 5.15.

5.1.2 Business Managers (or designated Project Manager) shall review Master Service Agreements (MSA) to ensure a selected contractor/vendor has creditable credentials to conduct permit-required confined space entry.

5.1.3 The Business Manager (or designated Project Manager) will consult with the Regional HSSE Manager/Coordinator to validate contractor/vendor credentials.

5.1.4 The Facility/Area Managers/PIC will review the scope of work with the contractor/vendor ensuring unique hazards of the permit-required confined space are identified and controlled.

5.1.5 The Facility/Area Managers/PIC will introduce the contractor/vendor to the Safe Work Permit (GEN_HSSE_003.8F) and confined space entry processes ensuring the contractor/vendor understands the process.

5.2 Training

5.2.1 Employees and contractors having confined space entry duties will be trained covering the following topics:

5.2.1.1 Hazards faced during entry to include mode, signs, symptoms, consequences and behavioral effects of potential exposures.

5.2.1.2 Proper use of the confined space entry equipment.

5.2.1.3 Methods to communicate with the Authorized Attendant.

5.2.1.4 Dangerous situations related to entry.

5.2.1.5 Prohibited conditions.

5.2.1.6 Emergency egress and evacuation.

5.2.1.7 Energy isolation methods.

5.2.1.8 Guidance during emergency rescue operations.

5.2.1.9 Safe Work Permitting procedures.

5.2.2 In addition to the topics above, the Authorized Representative will be properly trained to issue Confined Space Entry Permits. Authorized Representative may also include a trained Contractor Safety Representative. Additional required training will include:

5.2.2.1 Hazard recognition

5.2.2.2 Assessment of confined spaces

5.2.2.3 Atmospheric monitoring

5.2.2.4 Safe work and confined space permitting

5.2.2.5 Confined space entry requirements

5.2.3 In addition to the items above, the Authorized Attendant shall be trained in the following aspects of the entry process:

5.2.3.1 Authorized person entry process.

5.2.3.2 Performance of non-entry rescue techniques.

5.2.3.3 Diligence in performing **ONLY** the duties of an Attendant while fulfilling the role of Attendant.

5.2.4 In addition to the items above, the Entry Supervisor shall be trained in the following aspects of the entry process:

5.2.4.1 Entry operations are consistent with permit requirements.

5.2.5 Employees will be trained in the Safe Work Permitting process.

5.2.6 Employees will be trained if new permit-required confined space hazards are introduced or identified.

5.2.7 Employees will be trained when management or HSSE identifies process performance deficiency through observation and audits.

5.2.8 Other affected employees shall be trained at an awareness level in the hazards of a confined space and restrictions related to entry.

5.2.9 Company or third-party personnel providing rescue services will be verified through document/program review by HSSE to have the following:

5.2.9.1 Trained to perform rescue duties

5.2.9.2 Trained as a confined space entrant

5.2.9.3 Trained in Basic First Aid/CPR

5.2.9.4 Annually performs simulated rescues in confined spaces

5.2.10 Training records shall include employee name, trainer signature/initials and dates of training. Training records can be made available to employees and their authorized representative(s).

5.3 Permit-Required Space Identification & Labeling

5.3.1 The Facility/Area Managers shall identify and report potential permit-required confined spaces to the HSSE department.

5.3.2 Each confined space shall be evaluated by HSSE to determine proper identification and labeling.

5.3.3 The Facility/Area Managers/PIC will ensure that signs are posted to identify permit-required confined space points of entry.

5.3.4 Signage will be used to notify employees that only authorized entrants may enter the permit-required space. The sign shall indicate "DANGER – PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER"

5.3.5 Unauthorized entry into permit-required confined spaces shall be prevented.

5.3.5.1 Prevention measures include training, signs, and security measures.

5.3.5.2 Unauthorized Entrant Signs shall be worded similar to the following sign and present the same message.

5.3.6 The Entry Supervisor shall ensure barriers necessary to protect entrants from external hazards (pedestrians, vehicles, etc.) are deployed during entry into a permit-required confined space.

5.4 Atmospheric Monitoring and Equipment

5.4.1 Confined space atmospheres shall be tested with a properly calibrated direct reading instrument that senses oxygen, flammable gas vapors and potentially toxic air contaminants.

5.4.2 The atmosphere must be tested first for oxygen concentration, second for the presence of flammable gases or vapors and third for potential toxic air contaminants. Flammable gas and toxic air sensors may not function properly in low oxygen atmospheres.

5.4.3 The equipment used to conduct atmospheric monitoring shall be calibrated in accordance with the manufacturer's recommendations.

5.4.4 Entrants must be allowed to review calibration data before entry.

5.4.5 Prior to an entry, the Entrant will be allowed to witness a complete "self-calibration" cycle and review the results.

5.4.6 Personnel involved in confined space work must have the ability to view or access atmospheric monitoring and/or continuous monitoring results throughout the monitoring process.

5.4.7 Employees can request additional monitoring at any time during the confined space work process.

5.4.8 Atmospheric testing equipment will be utilized that meets or exceeds the requirements of nationally recognized testing and evaluation laboratories (i.e. UL, NSF, SGS, CE, etc.).

5.4.9 The atmosphere will be tested:

5.4.9.1 Before initial entry,

5.4.9.2 Before re-entry if the space is left unattended for more than 30 minutes.

5.4.9.3 At predetermined intervals specified on the Safe Work Permit (GEN_HSSE_003.8F).

5.4.10 Any forced air ventilation must be turned off at least 30 minutes prior to the initial atmospheric test.

5.4.10.1 This will ensure an accurate test of the internal atmospheric conditions is obtained.

5.4.10.2 Subsequent atmospheric tests can be made while forced air ventilation is operating.

5.5 Confined Space Classification

5.5.1 Classification of confined spaces will be evaluated by HSSE and Facility/Area Managers/PIC's including hazard assessments to determine permit entry requirements.

5.5.2 Classification of a **confined space** is determined by evaluating the following:

5.5.2.1 The space is large enough and configured that an employee can bodily enter and perform work,

5.5.2.2 The space has limited or restricted means for entry or exit, and

5.5.2.3 The space is not designed for continuous occupancy.

5.5.3 Classification of a **permit-required confined space** is determined by evaluating the following (Note: See flow diagram in Appendix A):

5.5.3.1 The space contains or has a potential to contain a hazardous atmosphere.

5.5.3.2 The space contains a material which has the potential for engulfing an entrant.

5.5.3.3 The space has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes down-ward and tapers to a smaller cross section.

5.5.3.4 The space contains any other recognized serious safety or health hazard.

5.5.4 Hazard assessments for permit-required confined spaces will contain:

5.5.4.1 Permit-required confined space identifier,

5.5.4.2 Type of space (i.e., horizontal/vertical tank, pipe, etc.),

5.5.4.3 Types of hazards, actual or potential,

5.5.4.4 Isolation points,

5.5.4.5 Entry/egress points,

5.5.4.6 Special personal protective equipment (PPE) requirements,

5.5.4.7 Unique emergency rescue equipment requirements, and,

5.5.4.8 External environmental considerations.

5.5.5 Confined space listings and hazard assessments will be conducted utilizing the Confined Space Hazard Assessment Form (GEN_HSSE_003.8F_CSE 103) reviewed annually or when a confined space is added, removed or modified.

5.5.6 Risk assessments will be documented for each permit-required confined space utilizing the Confined Space Hazard Assessment Form (GEN_HSSE_003.8F_CSE 103) Section 4.

5.5.7 HSSE and Operations personnel should use the risk ranking tool in Section 4 of the Confined Space Hazard Assessment Form as a guide to evaluate the risks of entry utilizing the following rating guidance:

5.5.7.1 High ratings can be considered as:
Major technical or performance issues have been identified that will have a severe impact on achieving safe entry. Hazards of the space are not very well understood. Many challenging concerns are not resolved and/or successfully tested/demonstrated under representative or actual field conditions. As such, entry considerations are expected to have severe negative effects on the ability make safe entry. Strong engineering controls should be applied.

5.5.7.2 Medium ratings can be considered as:
Technical or performance limitations have been identified that will have a moderate impact on achieving safe entry. Hazards of the space are somewhat-borderline understood. Nearly all (including the most challenging concerns) have been resolved and/or successfully tested/demonstrated under representative or actual field conditions. As such, entry considerations are expected to have modest negative effects on the ability to make safe entry. Engineering and administrative controls should be applied.

5.5.7.3 Low ratings can be considered as:
There are no technical or performance issues identified that will have any unexpected impact on achieving safe entry. Hazards of the space are well understood. Most of the challenging concerns have been resolved and/or successfully tested/demonstrated under representative or actual field conditions. As such, entry considerations are not expected to have severe negative impact on the ability to make safe entry. Administrative and PPE-controls should be applied.

5.6 Permit-Required Confined Space Reclassification

5.6.1 Prior to entry, the Facility Manager or Authorized Representative will contact HSSE for permit-required confined space reclassification determinations.

5.6.2 Permit-required confined spaces can be reclassified as non-permit - required confined spaces once all of the following criteria are met:

5.6.2.1 The space poses no actual or potential atmospheric hazard.

5.6.2.2 All other potential hazards within the space have been mitigated without entry into the space.

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. If it is necessary to enter the permit space to eliminate hazards the initial entry will follow permit-required confined space entry guidelines.

5.6.3 Document the mitigation of hazards in a permit space by utilizing the Confined Space Reclassification Form (GEN_HSSE_003.8F_CSE 101).

5.6.3.1 The form will be kept on site and made available to each person entering the space or to their Authorized Representative.

5.6.3.2 Reclassification of a confined space is not required daily as long as conditions do not change.

5.6.4 Prior to issuing a Safe Work Permit (GEN_HSSE_003.8F) the Authorized Representative will verify that the conditions (i.e., atmospheric / physical) identified on the Confined Space Reclassification form remain unchanged.

5.6.4.1 This will be verified and documented daily on the Safe Work Permit (GEN_HSSE_003.8F).

5.6.4.2 The Confined Space Reclassification form will be attached to the Safe Work Permit (GEN_HSSE_003.8F) field copy.

5.6.5 If entry into the space is required to make the determination whether the space may be reclassified, it will be done so under a permit-required confined space classification.

5.6.6 If the conditions of a reclassified confined space become hazardous all employees must exit the space and the space will be reevaluated as a permit-required confined space.

5.6.7 Reclassified non-permit-required confined spaces may be reclassified as permit-required confined spaces if changes in the use and configuration of the space have occurred. Reclassification considerations include:

5.6.7.1 The space poses an actual or potential atmospheric hazard.

5.6.7.2 Other recognized hazards exist within the space exist.

5.6.8 The Confined Space Reclassification Form (CSE 101) will serve as a certification containing date of reclassification, location of the space, justification for reclassification, hazard control/mitigation methods and signature of the evaluator.

5.6.9 Employees may review the reclassification documentation upon request and will be provided means to review the reclassification documentation by supervision.

5.7 Permit-Required Confined Space Entry Procedures

Before third party entry into permit required confined spaces, the following actions must occur:

5.7.1 A confined space sign shall be posted at entry and exit points to deter unauthorized entry.

5.7.2 Barricades and/or barriers will be used to prevent unauthorized entry into unattended confined space openings and to protect entrants from external hazards

5.7.3 Potential hazards should be identified and noted on the Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100).

5.7.4 Prior to entry into process type vessels the confined space shall be, ventilated or purged or both, to meet acceptable atmospheric monitoring levels.

5.7.4.1 Bulk storage vessels and terminal style storage tanks shall be emptied to the lowest possible level and ventilated.

5.7.5 Entry **will not** be permitted when:

- Lower Explosive Limit (LEL) is greater than **0**%
- IDLH conditions exist

5.7.6 The space shall be isolated from all hazardous energy sources. Refer to HSSE Procedure Manual Section 3.6 (Lockout/Tagout)

5.7.7 All lines connected to the confined space will be isolated by blinding or disconnecting and air gapping.

5.7.7.1 Any process line disconnected will be blind flanged.

5.7.8 The Entry Supervisor must verify conditions are acceptable for entry.

5.7.9 The following equipment should be available:

- Atmospheric monitoring/testing,
- Ventilation,
- Communication,
- Personal Protective Equipment,
- Lighting; NEC rated for Class 1 Division 1,
- Barriers or shields to protect entrants from exterior hazards,
- Ladders/stairs for safe ingress/egress, and
- Rescue equipment.

5.7.10 Conduct atmospheric testing initially before entry.

5.7.11 Continuous atmospheric monitoring will be conducted where ventilation systems are used in confined space during entry.

5.7.12 Positive pressure supplied air respirators shall be worn and continuous atmospheric monitoring shall be conducted when atmospheric conditions are within the following parameters:

5.7.12.1 The oxygen level is below 19.5% or above 23.5%,

5.7.12.2 The H_2S level is greater than 10 ppm,

5.7.12.3 The carbon monoxide level is greater than 25 ppm, or

5.7.12.4 The benzene level is greater than 1 ppm.

5.7.13 Continuous atmospheric monitoring will be conducted during external floating roof inspections classified as permit-required confined spaces.

5.7.14 Personnel performing in the following roles shall be identified on the Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100):

- Authorized Representative
- Authorized Entrant
- Attendant
- Entry Supervisor

5.7.15 Prior to entry into a permit-required confined space the Entry Supervisor must ensure that a plan for summoning rescue and emergency services is in place and documented on the Confined Space Rescue Pre-Plan (GEN_HSSE_003.8F_CSE 102).

5.7.16 A Confined Space Rescue Pre-Plan (GEN_HSSE_003.8F_CSE 102) for summoning rescue and emergency services shall be included with the Safe Work Permit (GEN_HSSE_003.8F).

5.7.17 The emergency plan must contain instruction for entrant rescue and emergency services.

5.7.18 Procedures for coordinating multiple workgroups shall be implemented when multi-work group entries occur.

5.7.19 Rescue contractor must be at the location of the confined space work and can only provide services for one “job” at a time.

5.7.19.1 Entry specific rescue planning shall be documented and coordination must be maintained across one “job” where multiple entries may be required.

5.7.20 The Entry Supervisor will ensure the emergency plan includes provisions for preventing unauthorized personnel from attempting a rescue.

5.7.21 A Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) shall be filled out completely, signed by required individuals, and posted at the entry location.

5.8 Entrant Requirements

5.8.1 The Entrant must understand the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of potential exposure.

5.8.2 The Entrant will properly use equipment necessary to maintain, enter or work in the space.

5.8.3 The Entrant will communicate with the attendant, as necessary.

5.8.4 The Entrant will alert the Attendant and exit the space when:

5.8.4.1 An order to evacuate is given by the Attendant or the Entry Supervisor,

5.8.4.2 The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

5.8.4.3 The Entrant detects a prohibited condition, or

5.8.4.4 An evacuation alarm is activated.

5.9 Attendant Requirements

5.9.1 The Attendant will understand the hazards and potential exposures that may be faced during entry, including information on the mode, signs or symptoms, and consequences of potential exposure.

5.9.2 The Attendant will be aware of the possible behavioral effects of hazard exposure of Entrants.

5.9.3 The Attendant will continuously maintain an accurate count of Entrants in the permit space and utilize the entry log on the back of the permit.

5.9.4 The Attendant will remain outside the permit space during entry operations until relieved by another Attendant.

5.9.5 The Attendant will communicate with Entrants as necessary to monitor their status and to alert them of the need to evacuate the space.

5.9.6 The Attendant will monitor activities inside and outside the space to determine if it is safe for Entrants to remain in the space.

5.9.7 The Attendant will order the authorized Entrants to evacuate the permit space immediately under any of the following conditions;

5.9.7.1 Detects a prohibited condition,

5.9.7.2 Detects the behavioral effects of hazard exposure of an Entrant,

5.9.7.3 Detects a situation outside the space that could endanger the Entrants, or

5.9.7.4 If the attendant cannot effectively and safely perform their duties.

5.9.8 The Attendant will activate rescue and other emergency services and initiates non-entry rescue.

5.9.9 The Attendant will prohibit unauthorized persons from entering the permit space.

5.9.10 The Attendant will not perform any duties that interfere with the primary duty to monitor and protect the Entrants of a confined space.

5.10 Entry Supervisor Requirements

5.10.1 The Entry Supervisor will understand the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of potential exposure.

5.10.2 The Entry Supervisor will verify that all tests specified by the permit have been conducted and that all procedures and equipment are in place before signing the permit and allowing entry to begin.

5.10.3 The Entry Supervisor will terminate the entry and cancel the permit when the job is complete or a prohibited condition arises.

5.10.4 The Entry Supervisor will verify that rescue services are available and that the means for summoning them are operable.

5.10.5 The Entry Supervisor has the authority to direct the actions of the entry crew and ensures that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

5.11 Record Keeping and Documentation

5.11.1 The Authorized Representative is responsible for completing the Confined Space Entry Form.

5.11.2 The Entry Supervisor will sign the permit signifying that all applicable sections of the permit have been completed properly and entry authorization is given.

5.11.3 The Safe Work Permit must be posted at the entry point of the confined space operations.

5.11.4 In the case where it is not feasible to post the permit at the entry point, the permit must be readily available for inspection by any person impacted by the entry operation.

5.11.5 Confined Space Entry authorization shall not exceed the time indicated on the Safe Work Permit (GEN_HSSE_003.8F).

5.11.6 The Entry Supervisor shall cancel or close the Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) when:

- Entry operations are completed;
- Conditions occur that are not allowed by the Confined Space Entry Permit; or,
- Conditions of the space change.

Important: If a hazardous condition is detected during the entry, all entrants will leave the space immediately. The space will be evaluated to determine how the condition developed and effective corrective measures will be implemented to establish and maintain a safe work environment before re-entry is allowed. A new Safe Work Permit (GEN_HSSE_003.8F) and Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) will be issued after corrective actions have been taken.

5.11.7 The Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) shall be retained at the facility or field office for 2 years.

5.12 Completing the Permit-Required Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100)

5.12.1 The Authorized Representative will complete Date, Location/Unit, Equipment/Line ID and Safe Work Permit number.

5.12.2 Hazard Assessment Section – The Authorized Representative will perform a hazard assessment by reviewing, checking appropriate boxes and identify methods of controlling and mitigating hazards in the following sections:

5.12.2.1 Atmospheric Hazards

5.12.2.2 Physical Hazards

5.12.2.3 Tank Specific Hazards

5.12.3 Attendant Section – The Authorized Representative will identify the method(s) of communication by marking the appropriate check box.

5.12.3.1 The Authorized Representative will indicate the first and last name of the Attendant(s).

5.12.3.2 The Authorized Representative will indicate that additional attendants are required by marking the appropriate check box.

5.12.4 Additional Safety Precautions Section – Authorized Representative will:

5.12.4.1 List any additional PPE requirements on the Safe Work Permit (GEN_HSSE_003.8F).

5.12.4.2 Mark the check box indicating “Danger” sign has been posted at each entrance of a confined space.

5.12.4.3 List any special instructions in the space provided.

5.12.5 Rescue Information Section - The Authorized Representative will complete the Rescue Information Section by marking the appropriate boxes if applicable, inserting appropriate rescue organization information and method of contact.

5.12.5.1 If a retrieval system is not used, provide explanation.

5.12.6 Approval Section - Authorized Representative will verify Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) is completely filled out and then print and sign name.

5.12.6.1 Entry Supervisor will print and sign name.

5.12.6.2 Spaces are provided for additional authorization signatures (i.e., supervision, inspection, safety, etc.) if required by other safety policies, procedures or job plan.

5.12.7 Confined Space Entry Log (Back Page Field Copy)
The Attendant will document:

5.12.7.1 Each Attendant(s) (Name and Company)

5.12.7.2 Each Entrant (Name, Company, Time-in and Time-out)

5.12.8 Post-Entry Debrief – The Authorized Representative conducts a post entry debriefing on all Permit Required Confined Space Entries.

5.13 External Floating Roof Tank Entry

5.13.1 Accessing the top of an external floating roof tank is considered a confined space entry operation because it meets the definition in Section 5.5.2 of this procedure. This confined space may be permit-required or may be reclassified as a non-permit-required confined space if the conditions of Section 5.6.2 can be satisfied.

In order for a Genesis employee to access the top of an external floating roof tank, the conditions and process for reclassifying the space as non-

permit-required must be followed, including completing a Safe Work Permit and completing the Confined Space Reclassification Form (CSE 101). If all the conditions for reclassifying the space are met, Genesis employees may conduct the entry. If not, an adequately trained and qualified third party must be used for entry.

In addition to the requirements for entry into a non-permit-required confined space (i.e., a reclassified confined space) the following steps must also be taken.

5.13.1.1 Prior to descent onto the floating roof, the Entry Supervisor, Attendant, or Entrant shall contact the Operations Control Center (OCC) at Village Green in Houston, Texas and inform the Board Operator that access to a floating roof is going to occur. The Entry Supervisor, Attendant or Entrant shall contact the OCC every 15 minutes during the entry operation. Upon exiting the confined space, the Entry Supervisor, Attendant, or Entrant shall notify the OCC that the operation is complete.

5.13.1.1.1 The following information shall be entered into the Board Operator's Daily Log:

- Time phone call received;
- Person making entry onto floating roof;
- Location of the tank; and,
- Time phone call received notifying Board Operator that access has been completed.

5.13.1.2 Pumps and lines into and out of the tank must be isolated according to Genesis Lock Out/Tag Out procedures. If the tank was recently filled with product, an adequate amount of time should be allowed to pass before attempting entry. When non-covered external floating roof tanks are refloated, vapor concentrations usually reach safe concentrations within 1-4 hours depending on product, roof conditions, roof height, and wind speed.

5.13.1.3 The Entrant accessing the roof will carry a 4 element, atmospheric monitor calibrated for oxygen, LEL, carbon monoxide (CO) and hydrogen sulfide (H_2S) and will conduct continuous monitoring while on the roof.

5.13.1.4 The Entrant shall be equipped with a full face-piece, positive pressure, supplied air respirator with a 5-minute escape bottle (i.e., “pack”) attached. Note: all requirements of the Genesis Respiratory Protection Procedure 6.6P must also be met, including medical fitness.

5.13.1.5 The Entrant shall be equipped with a personal H_2S monitor worn in the breathing zone (within 10 inches of user’s nose/mouth) and set to alarm at 10 ppm.

5.13.1.6 The Entrant shall be wearing a full body rescue harness equipped with dorsal and shoulder D-rings.

5.13.1.7 The Entrant and Attendant will inform the station operator(s) that entry is being performed.

5.13.1.8 The Entrant and Attendant will maintain radio contact with site supervision.

5.13.1.9 An Attendant will remain at the top of the ladder landing the entire time the Entrant is accessing the roof.

5.13.2 Prior to entry, the Entry Supervisor should consider the various factors that may affect the potential atmosphere in the space. These include:

5.13.2.1 Condition of the tank and tank seals,

5.13.2.2 Product currently in the tank,

5.13.2.3 Potential for H_2S in the tank,

5.13.2.4 Physical state of the product in the tank (temperature, vapor pressure, gravity, contaminants, etc.),

5.13.2.5 Any mixing or agitation of tank contents,

5.13.2.6 Poor roof condition or roof out of flotation, and,

5.13.2.7 When product was last pumped into the tank. When external floating roof tanks are refloated, it generally takes 1-4 hours for vapor concentrations within the space to reach safe levels.

5.13.3 Effort should be made to schedule entry onto external floating roof tanks at a time when the floating roof is in its highest practical position. Vapors dissipate and escape more rapidly when the floating roof is at a higher position.

5.13.4 Entrants shall not be allowed to descend onto an external floating roof that is out of flotation (sitting on its legs).

5.13.5 Floating roofs should be visually inspected from above for structural stability prior to descent. Corrosion or other structural deficiencies may not always be noticeable from the top of the tank platform. If there is any doubt as to the structural integrity of the floating roof, metal thickness readings or other appropriate structural testing should be obtained using proper safety precautions prior to allowing access.

5.13.6 Prior to and during the descent onto the roof, atmospheric conditions will be monitored. Acceptable atmospheric conditions for access to an external floating roof are:

- Oxygen level between 19.5% and 23.5%
- LEL no greater than **0**%
- Hydrogen Sulfide less than 10 ppm
- Carbon Monoxide less than 25 ppm
- Other potential atmospheric hazards are below applicable permissible exposure limits (e.g., benzene)

5.13.6.1 In order to measure the atmosphere prior to entering the confined space, a direct reading instrument capable of collecting remote samples must be used. These instruments are typically equipped with an air suction pump, probe, and tubing sufficient to reach the atmosphere being tested. Test samples should be taken at several elevations within the space by lowering the test instrument from the top of the tank.

5.13.7 Continuous monitoring will be used for the duration the roof access operation.

5.13.8 Access shall be terminated and the roof evacuated immediately if atmospheric conditions reach unacceptable levels (see 5.13.6).

5.13.9 Emergency rescue plans are required for permit-required confined space entry operations. Facilities should also consider emergency rescue plans covering entry onto non-permit required floating roofs. The Entry Supervisor and/or Authorized Representative signing the Safe Work Permit should consider the need for rescue retrieval systems or

emergency rescue plans dependent upon local site conditions. Provisions for Attendant replacement or back-up should also be considered.

5.14 Refinery Services – Confined Space Entry

5.14.1 Where it is required for Refinery Services personnel to utilize their host site confined space entry program, use of the Genesis Confined Space Entry Permit (GEN_HSSE_003.8F_CSE 100) will not be required.

5.14.2 If a host site company's confined space entry program is utilized, Genesis employees shall be trained to understand the host's confined space entry program.

5.14.3 If the host site confined space entry program does not meet the minimum requirements of this procedure, entry shall be evaluated by Operations and HSSE representatives for equivalent means of entry.

5.15 Ruston Maintenance Shop - Trailer Tank Internal Inspection Procedure

5.15.1 Genesis employees located at the Ruston Maintenance Facility will be allowed to enter Commercial Motor Vehicle (CMV) trailer tanks for the purposes of conducting inspections as required by 49 CFR 180.407.

5.15.2 No trailer will be entered prior to being washed out and when needed, ongoing a gas freeing process having dangerous or explosive gases removed by a qualified third party.

5.15.3 No trailer will be entered if a visual inspection from the outside of the tank indicates that the interior of the tank is not clean.

5.15.4 CMV trailer tanks are considered permit-required confined spaces and all requirements of this procedure are mandatory including but not limited to;

5.15.4.1 Completion of a Safe Work Permit

5.15.4.2 Completion of a Confined Space Entry Permit

5.15.4.3 Utilization of a retrieval system

5.15.4.4 Completion of a Confined Space Rescue Pre-Plan

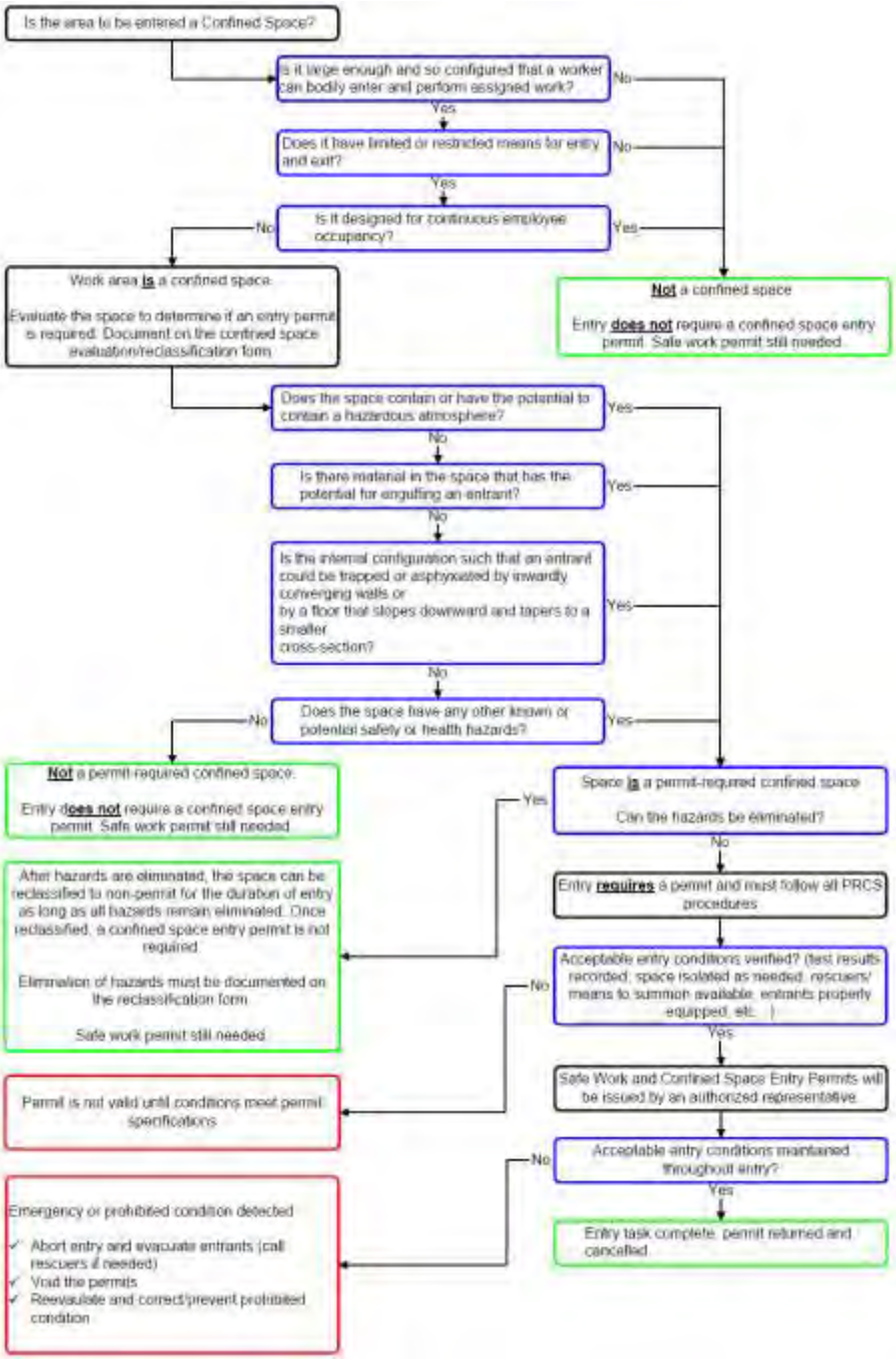
5.15.4.5 Completion of a Confined Space Hazard Assessment

5.15.5 Ruston Maintenance will create and adhere to a site-specific trailer tank internal inspection job plan in addition to the above requirements.

5.16 References

Procedure Title/Source	Procedure Identification
OSHA Standard	29 CFR 1910.146 - Permit Required Confined Spaces
OSHA Standard	29 CFR 1910.147 - Control of Hazardous Energy (lockout/tagout)
OSHA Standard	29 CFR 1910.134 - Respiratory Protection
American National Standards Institute (ANSI)	Z117.1 - Safety Requirements for Confined Spaces

Appendix A – Confined Space Classification Process



03.3P-Excavation and Trenching

3.3 Excavation and Trenching

Purpose

The purpose of this procedure is to educate Genesis Energy, LP (GEL) employees in the proper techniques of preparing and digging excavations, as well as put in place work practices and procedures that will protect GEL and contract, employees from hazards that may be found in or around excavations or trenches.

Policy

It is the policy of GEL to ensure safe working conditions around all excavations performed or controlled by GEL. All excavations overseen or dug by GEL will conform to OSHA excavations requirements in accordance with 29 CFR 1926.650, 651, 652 subpart P.

Scope

This procedure applies to all excavations overseen by and performed by GEL employees or their contractors on all GEL property owned, leased or operated.

Definitions

Accepted engineering practices	The standards of practice required by a registered professional engineer
Affected Person	Personnel who enter or work in the area of any excavation
Aluminum Hydraulic Shoring	A manufactured shoring system consisting of aluminum hydraulic cylinders (cross braces) used with vertical rails (uprights) or horizontal rails (wales). Such system is designed to support the sidewalls of an excavation and prevent cave-ins
Angle of Response	The greatest angle above the horizontal plane where soil will lie stable without sliding
Authorized Person	An employee who implements the Excavation Procedure.
Backfill	The material used to fill an excavation

Bell-bottom pier hole	A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape
Benching (Benching system)	A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or more horizontal steps, usually with vertical or near-vertical surfaces between levels
Cave-in	The movement of soil or rock into an excavation, or the loss of soil from under a trench shield or support system, in amounts large enough to trap, bury, injure or immobilize a person
Competent person	One who has been trained to identify hazards in the workplace, or working conditions that are unsafe for employees, and has the authority to have these hazards corrected
Cross braces	The horizontal members of a shoring system installed from side to side of the excavation. The cross braces bear against either uprights or Wales
Distressed Soil	Soil that is in a condition where a cave-in is imminent or likely to occur
Disturbed Soil	Soil that has been previously excavated
Excavation	Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal
Faces or sides	The vertical or inclined earth surfaces formed as a result of excavation work
Failure	The movement or damage of a structural member or connection that makes it unable to support loads
Hazardous atmosphere	An atmosphere that is any of the following, explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, that may cause death, illness, or injury
Kickout	The accidental movement or failure of a cross brace

Maximum Allowable Slope	The steepest incline of an excavation that offers protection from a cave-in
Protective system	A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection
Ramp	An inclined walking or working surface that is used to gain access to one point from another. A ramp may be constructed from earth or from structural materials such as steel or wood
Registered Professional Engineer	A person who is registered as a professional engineer
Sheeting	The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system
Shield (Shield system)	A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29CFR 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes or trench shields"
Shoring (Shoring system)	A structure that is built or put in place to support the sides of an excavation to prevent cave-ins
Sloping (Sloping system)	Sloping the sides of the excavation away from the excavation to protect employees from cave-ins. The required slope will vary with soil type, weather, and surface or near surface loads that may affect the soil in the area of the trench (such as adjacent buildings, vehicles near the edge of the trench and so forth)

Soil Classification	For the purpose of this subpart is a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, & Type C, in decreasing order of stability. With solid rock being Type A and loose Soil being Type C
Stable rock	Natural solid mineral material that can be excavated with vertical sides that will remain intact while exposed
Structural ramp	A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps
Support system	A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation
Tabulated data	Tables and charts approved by a registered professional engineer and used to design and construct a protective system
Trench (Trench excavation)	A narrow excavation (in relation to its length) made below the surface of the ground, made below the surface of the ground. In general the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15ft
Trench box or shield	See "Shield"
Uprights	The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting"
Wales	Horizontal members of a shoring system placed in the direction of the excavation face whose sides bear against the vertical members of the shoring system or earth (the uprights or sheeting)

Training

All personnel involved in trenching or excavation work shall be trained in the requirements of this procedure, and CFR 29 192.650,651,652, subpart P

- Training shall be performed before the employee is assigned duties in excavations.
- All Affected Persons shall be trained to an awareness level.
- At least one person per district shall have excavation Competent Person training
- Retraining will be performed whenever work site inspections indicate that an employee does not have the necessary knowledge or skills to safely work in or around excavations
- Identify all underground utilities and equipment prior to any earth removal, and initiate One Call notification.
- Shut down and verify lockout/tagout of cathodic protection.
- Contact the appropriate manager, supervisor, or specialist for drawings of all structures in the excavation area.
- Probe the area to positively locate the underground structures.
- Conduct line locate to identify any underground structure.
- Underground Installations such as sewers, telephone lines, fuel lines, electrical conduit, water line, or any other underground installation that may be encountered during excavation work shall be determined and marked prior to opening an excavation. (Use the local state Call before you dig system)
- Underground Utilities Marking Codes.
    - White: Proposed Excavation
    - Pink: Temporary Survey Markings.
    - Red: Electric Power Lines, Cables, Conduit and Lighting cables.
    - Red: Electric Power Lines, Cables, Conduit and Lighting cables.
    - Yellow: Gas, Oil, Petroleum and Gaseous Materials.
    - Orange: Telephone, Cable TV, Communication, Alarm and Signal Lines.
    - Blue: Potable Water.

- Green: Sanitary Sewers, Storm Sewers, and Drain Lines.
- Purple: Reclaimed water, Irrigation and Slurry Lines.

- If it is not possible to establish the exact location of these installations, the work may proceed with caution, if detection equipment or other safe and acceptable means are used to locate the utility.
- Identify all surface encumbrances, such as equipment, materials, supplies, permanent installations (for example, buildings or roadways), trees, brush, boulders, and other objects at the surface that could present a hazard to employees, or equipment working in the excavation shall be removed or supported as necessary to protect employees.
- Excavation shall be done in a manner that does not endanger the underground installations or the employees engaged in the work. Utilities left in place shall be protected by barricades, shoring, suspension or other means as necessary to protect employees.
- Soil shall be classified by a competent person or a Certified Professional Engineer.

Soil Classification Definitions

Cemented Soil	Soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure
Cohesive Soil	Clay (fine grained soil), or soil with a high clay content, which has cohesive strength. ➢ Cohesive Soil does not crumble, ➢ Can be excavated with vertical sideslopes, ➢ It is plastic when moist. ➢ Is hard to break up when dry. ➢ Exhibits significant cohesion when submerged. ➢ Includes clayey slit, sandy clay, silty clay, clay and organic clay
Dry Soil	Soil that does not exhibit visible signs of moisture content
Fissured Soil	A soil material that has a tendency to break along definite

	planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface
Granular Soil	Gravel, sand, or silt (coarse grained soil) ➢ No clay content ➢ No cohesive strength (some moist granular soils exhibit apparent cohesion) ➢ Cannot be molded when moist and crumbles easily when dry
Layered System	Two or more distinctly different soil or rock type arranged in layers. Micaceous seams (resembles mica) or weakened planes in rock or shale are considered layered
Moist Soil	A condition in which soil looks and feels damp. ➢ Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling ➢ Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles
Plastic	A property of soil which allows the soil to be deformed or molded without cracking, or appreciable volume change
Saturated Soil	Soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as pocket penetrometer of sheer vane
Submerged Soil	Soil which is under water of is free seeping

Soil Classification

All soil must be classified by the excavation competent person, as stable rock, type "A", type "B", or type "C".

Note: If soil classification is not done the competent person must assume the soil is Type "C" and the excavation shall be conducted as in Type "C" soil.

- Soil classification must be made on the basis of at least one visual and one manual test
- No soil classification should be based on a single source of data.
- **Visual classification examples:**
  - Presence of Water
  - Particle Size
  - Evidence of Spalling and/or Fissures
  - Signs of Distress
  - Evidence of Environmental Exposure
  - Presence of soil layering
- Manual classification examples
  - Pocket Penetrometer
  - Ribbon Test
  - Roll Test
  - Thumb Penetration
  - Shear Vane
  - Sedimentation Test

Note: In a layered system the system shall be classified in accordance with its weakest layer. However each layer maybe classified individually where a more stable layer lies under a less stable layer.

Type "A" Soil

- Type A soil is cohesive soil, (it sticks together).
- Unconfined compressive strength of 1.5 tons per square foot or greater.
- Example of type A, cohesive soils or
  - Clay,
  - Silty clay,
  - Sandy clay,
  - Clay loam,
  - In some cases silty clay loam and sandy clay loam.
  - Cemented soils such as caliche and hardpan are also considered type A.

- **Note: Soil Cannot be Type A if:**
  - The soil is fissured; or
  - Subject to vibration from heavy traffic, pile driving or similar effects; or
  - The soil has been previously disturbed; or
  - The soil is part of a sloped layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
  - The material is subject to other factors that would require it to be classified as a less stable material.

Type "B" Soil

- Cohesive soil
- Unconfined compressive strength greater than 0.5 tons per square foot but less than 1.5 tsf; or
- Granular cohesive soils including:
  - Angular gravel (similar to crushed rock)
  - Silt
  - Silt loam
  - Sandy loam
  - In some cases, silty clay loam and sandy clay loam.
  - Previously disturbed soils except those which would otherwise be classed as Type C soil.
  - Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
  - Dry rock that is not stable; or
  - Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type "C" Soil

- Cohesive soil with an unconfined compressive strength of 0.5 tons per square foot or less; or
- Granular soils including
  - Gravel
  - Sand
  - Loamy sand.
- Submerged soil or soil from which water is freely seeping; or
- Submerged rock that is not stable; or
- Material in a sloped layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4:1V) or steeper

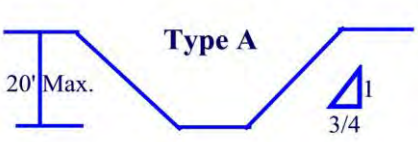
Sloping and Benching Systems

The slope and configuration of sloping and benching systems shall be selected in accordance with the type soil and in compliance with CFR 29 1926.651 Subpart P

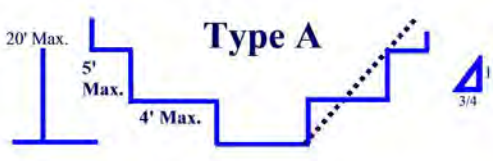
- All benched excavations in Types A, B, & C. soil must also have the maximum slope required by that particular soil type.
  - **Stable Rock** May be excavated at a vertical 90º

EXCAVATIONS MADE IN "TYPE A SOIL"

All simple slope in Type A, excavations 20 feet or less in depth shall have a maximum allowable slope of ¾:1

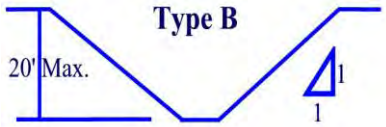


Multiple Bench

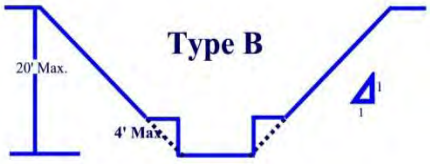


EXCAVATIONS MADE IN "TYPE B SOIL"

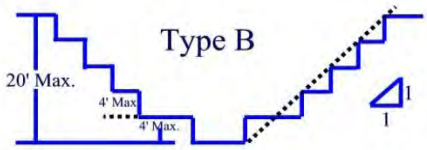
All simple slope in Type B, excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1



All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions of
4 ft in height.

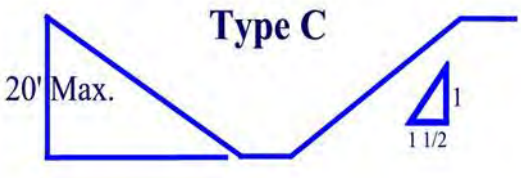


This bench allowed in cohesive soil only.



EXCAVATIONS MADE IN "TYPE C SOIL"

All simple slope excavations in Type C Soil, 20 feet or less in depth shall have a maximum allowable slope of 1 ½:1.



Note: Type C Soil cannot be benched.

Protection of the public

- Barricades, walkways, lighting and posting shall be provided as necessary for the protection of the public prior to the start of excavation operations.
- Guardrails, fences, or barricades and signs, shall be provided on excavations adjacent to walkways, driveways and other pedestrian or vehicle thoroughfares. Warning lights or other illumination shall be maintained as necessary for the safety of the public and employees from sunset to sunrise.
- Wells, holes, pits, shafts and all similar hazardous excavations shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type shall be backfilled as soon as possible.
- Walkways or bridges protected by standard guardrails shall be provided where employees and the general public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toeboard shall be used.

Protection of Workers in Excavations

- **Access and means of egress**, such as stairs ladders or ramps shall be provided where employees are required to enter trench excavations over 4 feet deep. The maximum distance of lateral travel (e.g., along the length of the trench) required to reach the means of egress shall not exceed 25 feet.
- **Structural ramps**: Used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a person qualified in structural design, and shall be constructed in accordance with the design.
    - Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent movement or displacement.
    - Structural members used for ramps and runways shall be of uniform thickness.
    - Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

  - Structural ramps used in place of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

- **Ladders**: When portable ladders are used, the ladder side rails shall extend a minimum of 3 foot above the upper surface of the excavation.
  - Two or more ladders, or a double-cleated ladder, will be provided where 25 or more employees will be conducting work in an excavation where ladders serve as the primary means of egress, or where ladders serve two-way traffic.
  - Ladders will be inspected prior to use for signs of damage or defects. Damaged ladders will be removed from service and marked with "Do Not Use" until repaired.
  - Ladders shall be used only on stable and level surfaces unless secured. Ladders placed in any location where they can be displaced by workplace activities or traffic shall be secured, or barricades shall be used to keep these activities away from the ladder.
  - Non-self-supporting ladders shall be positioned so that the foot of the ladder is one-quarter of the working length away from the support. (4V:1H)
  - Employees shall not be allowed to carry any object or load while on the ladder that could cause them to lose their balance and fall.

- **Vehicular traffic**: Employees exposed to vehicular traffic shall be provided with, and shall wear; warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

- **Warning vests**: Worn by flagmen shall be red, yellow or orange, and shall be of reflectorized material.

- **Falling Loads:** No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by vehicle and any spillage or falling materials.
  - Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles provide adequate protection for the operator during loading and unloading operations.

- **A warning system** shall be used when mobile equipment is operated adjacent to the edge of an excavation if the operator does not have a clear and direct view of the edge of the excavation. The warning system shall consist of barricades, hand

or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

- **Confined Space:** An excavation over 4 foot in depth by OSHA CFR 29 1910.146 definition is considered to be a confined space.

- **Permit Required Confined Space:** An excavation over 4 foot in depth that has any of the following characteristics is a permit-required confined space and therefore requires a confined space permit be issued and completed before entry in to the space, and the space shall be treated as a permit-required confined space as long as the potential hazard exist.

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

- **Hazardous atmospheres**: The competent person shall test the atmosphere in excavations over 4 feet deep when there is a potential atmospheric hazard.

  - A hazardous atmosphere could be expected, for example, in excavations, in areas where hazardous substances are stored nearby, or in excavations near pipelines, or vessels containing gas or crude oil or chemicals.
  - Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than <19.5 or more than >23.5 percent oxygen or toxic atmospheres above the PEL.
  - Forced ventilation or other effective means shall be used to prevent employee exposure to an atmosphere containing a flammable gas in excess of 10 percent of the lower flammability limit; or a toxic atmosphere above the PEL
  - When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, continuous air monitoring will be performed by the competent person. The device used for atmospheric monitoring shall be equipped with an audible and visual alarm.

- Atmospheric testing will be performed using a properly calibrated direct reading gas monitor. Direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres.
- Each atmospheric testing instrument shall be calibrated on a schedule and in the manner recommended by the manufacturer except:
    - Any at Any atmospheric testing instrument that has not been used within thirty (30) days shall be recalibrated prior to use.
    - Each atmospheric testing instrument shall be calibrated at least every six (6) months by trained personnel. (Follow manufacturer's recommendations).

Personal Protective Equipment

The following PPE shall be made available and worn by all GEL and contract personnel working in and around excavations.

- **Hard Hats**: when working under any equipment or overhead work
- **Steel toed shoes** at all times while working in excavations. (Steel toed rubber boots may be used in excavations).
- **Eye Protection**: Safety Glasses with side shield shall be worn at all times.
    - Employees exposed to hazards produced by, or performing, welding, cutting, or brazing operations shall wear, approved spectacles or a welding face shield or helmet, as applicable.
- **Hand Protection**: Employees shall wear, gloves approved for the task
- **Full body Harness and Life Line**: Employees entering bell-bottom pier holes or other similar deep and confined footing excavations shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.
- **Fall Protection**: Employees and the public shall be protected from falling when an excavation is 6 feet or more in-depth, by guardrail systems, fences, barricades, cover, or a tie-back system, as applicable.

- **Emergency rescue equipment**, such as breathing apparatus, a safety harness and line, shall be readily available where hazardous atmospheric conditions exist or may develop during work in an excavation.
    - Only personnel that have received approved training and have appropriate equipment shall attempt retrieval that would require entry into a hazardous atmosphere.

Walkways and Guardrails

- Walkways shall be provided where employees or equipment are permitted to cross over excavations.
- Guardrails shall be provided where walkways, are 6 feet or more above lower levels.

Protection from hazards associated with water accumulation.

- Employees shall not work in excavations that contain or are accumulating water unless precautions have been taken to protect employees against the hazards posed by water accumulation. Precautions may include:
    - Special support or shield systems to protect from cave-ins,
    - Water removal to control the level of accumulating water,
    - Use of safety harnesses and lifelines.
    - If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operation shall be monitored by a competent person trained in the use of the equipment.
    - If excavation interrupts the natural drainage of surface water such as streams; diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation.
    - Precautions shall also be taken to provide adequate drainage of the area adjacent to the excavation.
    - The Project Manager shall inform workers of the precautions or procedures that are to be followed if water accumulates or is accumulating in an excavation.

Stability of Adjacent Structures

- The project manager will determine if the excavation work could affect the stability of adjoining buildings, walls, sidewalks or other structures.
- Support systems (such as shoring, bracing, or underpinning) shall be used to assure the stability of structures and the protection of employees where excavation operations could affect the stability of adjoining buildings, walls, or other structures.
- Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when: A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or the excavation is in stable rock; or
- A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
- A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
- Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or other method of protection is provided to protect employees from the possible collapse of such structures.
- Where review or approval of a support system by a registered professional engineer is required, the area manager shall secure this review and approval in writing before the work is begun.

Protection of Employees from Falling Objects and Loose Rocks or Soil

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of:

- Installation of protective barricades, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or
- Benching sufficient to contain falling material.

- Excavation personnel shall not be permitted to work above one another where the danger of falling rock or earth exists.
- Employees shall be protected from excavated materials, equipment or other materials that could pose a hazard by falling or rolling into excavations.
- Protection shall be provided by keeping such materials or equipment at least 2 feet from the edge of excavations, by the use of restraining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
- Materials and equipment may, as determined by the project manager, need to be stored further than 2 feet from the edge of the excavation if a hazardous loading condition is created on the face of the excavation.
- Materials piled, grouped or stacked near the edge of an excavation must be stable and self-supporting.

Inspection by a Competent Person

- The competent person, shall conduct daily inspections of excavations, adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when the trench will be or is occupied by employees.
- If the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmosphere, or other hazardous conditions, exposed employees shall be removed from the hazardous area until precautions have been taken to assure their safety.
- The project manager shall maintain a written log of all inspections conducted. This log shall include the date, work site location, results of the inspection, and a summary of any action taken to correct existing hazards. (Appendix A)

Support System

Support systems, shield systems, or other protective systems drawn from manufacturer's tabulated data shall be constructed and used in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

- Materials and equipment used for protective systems shall be free from damage or defects that might affect their proper function.
- Manufactured materials and equipment used for protective systems shall be used and maintained in accordance with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.
- When material or equipment used for protective systems are damaged, they shall be examined by a competent person to evaluate its suitability for continued use.
- If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service.

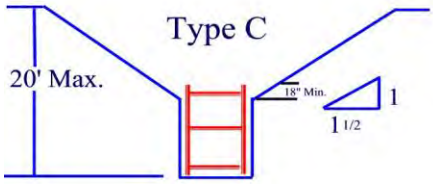
Installation and Removal of Support System

- Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other potential hazards.
- Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
- Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to support.
- Before temporary removal of individual support members begins, additional precautions shall be taken as directed by the Project Manager to ensure the safety of employees. These precautions could include; the installation of other structural members to carry the loads imposed on the support system.
- Removal of support systems shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly. If there is any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation the work shall be halted until it can be examined by the Project Manager.
- Backfilling shall progress together with the removal of support systems from excavations.
- Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench. There shall be no

indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

Shield systems

- Shield systems shall not be subjected to loads that are greater than those they were designed to withstand.
- Shields shall be installed in a manner that will restrict lateral or other hazardous movement of the shield that could occur during cave-in or unexpected soil movement.
- Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.
- All trench boxes whether used in Type A, B, or C soil shall have at least 18 inches above the top of the vertical side. All such excavations shall have a maximum slope as required by that particular soil type.



Incident Investigation

All incidents that result in injury to workers, as well as near misses, regardless of their nature, shall be reported and investigated. Investigations shall be conducted by the area manager, as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence.

In the event of such an incident, HSSE Procedure shall be reevaluated by HSSE Department and Operations managers to determine if additional practices, procedures, or training are necessary to prevent similar future incidents.

References

Procedure Title/Source	Procedure Identification
Specific Excavation Requirements OSHA Standard	29 CFR1926.650,651,652 Subpart P
Manual In Uniform Traffic Control Devices for streets and Highways; relating to Barricades	ANSI D.6 1-1971

Appendix A

- Excavation Inspection & Soil Classification Form

Appendix B

- Minimum Top Width Charts

Appendix C

- Excavation Slope Calculation Charts

Excavation Inspection and Soil Classification Form

Type A Soil – Minimum Top

BOTTOM WIDTH	Depth of Cut							
	6	8	10	12	14	16	18	20
2	11	14	17	20	23	26	29	32
3	12	15	18	21	24	27	30	33
4	13	16	19	22	25	28	31	34
5	14	17	20	23	26	29	32	35
6	15	18	21	24	27	30	33	36
7	16	19	22	25	28	31	34	37
8	17	20	23	26	29	32	35	38
9	18	21	24	27	30	33	36	39
10	19	22	25	28	31	34	37	40
11	20	23	26	29	32	35	38	41
12	21	24	27	30	33	36	39	42
13	22	25	28	31	34	37	40	43
14	23	26	29	32	35	38	41	44
15	24	27	30	33	36	39	42	45
16	25	28	31	34	37	40	43	46
17	25	29	32	35	38	41	44	47
18	27	30	33	36	39	42	45	48
19	28	31	34	37	40	43	46	49
20	29	32	35	38	41	44	47	50
21	30	33	36	39	42	45	48	51
22	31	34	37	40	43	46	49	52
23	32	35	38	41	44	47	50	53
24	33	36	39	42	45	48	51	54
25	34	37	40	43	46	49	52	55

To determine minimum top width, read across the top for the depth of the excavation, down the side for the width of the excavation bottom, and then read the corresponding minimum top width of the excavation

Type B Soil – Minimum Top

BOTTOM WIDTH	Depth of Cut							
	6	8	10	12	14	16	18	20
2	14	18	22	26	30	34	38	42
3	15	19	23	27	31	35	39	43
4	16	20	24	28	32	36	40	44
5	17	21	25	29	33	37	41	45
6	18	22	26	30	34	38	42	46
7	19	23	27	31	35	39	43	47
8	20	24	28	32	36	40	44	48
9	21	25	29	33	37	41	45	49
10	22	26	30	34	38	42	46	50
11	23	27	31	35	39	43	47	51
12	24	28	32	36	40	44	48	52
13	25	29	33	37	41	45	49	53
14	26	30	34	38	42	46	50	54
15	27	31	35	39	43	47	51	55
16	28	32	36	40	44	48	52	56
17	29	33	37	41	45	49	53	57
18	30	34	38	42	46	50	54	58
19	31	35	39	43	47	51	55	59
20	32	36	40	44	48	52	56	60
21	33	37	41	45	49	53	57	61
22	34	38	42	46	50	54	58	62
23	35	39	43	47	51	55	59	63
24	36	40	44	48	52	56	60	64
25	37	41	45	49	53	57	61	65

To determine minimum top width, read across the top for the depth of the excavation, down the side for the width of the excavation bottom, and then read the corresponding minimum top width of the excavation

Type C Soil – Minimum Top Width

BOTTOM WIDTH	Depth of Cut								
	6	8	10	12	14	16	18	20
2	20	26	32	38	44	50	56	62
3	21	27	33	39	45	51	57	63
4	22	28	34	40	46	52	58	64
5	23	29	35	41	47	53	59	65
6	24	30	36	42	48	54	60	66
7	25	31	37	43	49	55	61	67
8	26	32	38	44	50	56	62	68
9	27	33	39	45	51	57	63	69
10	28	34	40	46	52	58	64	70
11	29	35	41	47	53	59	65	71
12	30	36	42	48	54	60	66	72
13	31	37	43	49	55	61	67	73
14	32	38	44	50	56	62	68	74
15	33	39	45	51	57	63	69	75
16	34	40	46	52	58	64	70	76
17	35	41	47	53	59	65	71	77
18	36	42	48	54	60	66	72	78
19	37	43	49	55	61	67	73	79
20	38	44	50	56	62	68	74	80
21	39	45	51	57	63	69	75	81
22	40	46	52	58	64	70	76	82
23	41	47	53	59	65	71	77	83
24	42	48	54	60	66	72	78	84
25	43	49	55	61	67	73	79	85

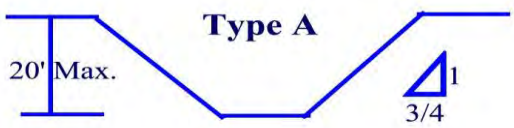
To determine minimum top width, read across the top for the depth of the excavation, down the side for the width of the excavation bottom, and then read the corresponding minimum top width of the excavation

Excavation Slope Calculation Chart

Type A Soil

Trench Depth In feet	Length of slope in feet	Bottom Width in feet	Total Width at top in feet	Degrees to achieve 3/4 : 1
4	3	6	12	53 °
5	3.75	6	13.5	53 °
6	4.5	6	15	53 °
7	5.25	6	16.5	53 °
8	6	6	18	53 °
9	6.75	6	19.5	53 °
10	7.5	6	21	53 °
11	8.25	6	22.5	53 °
12	9	6	24	53 °
13	9.75	6	25.5	53 °
14	10.50	6	27	53 °
15	11.25	6	28.5	53 °
16	12	6	30	53 °
17	12.75	6	31.5	53 °
18	13.5	6	33	53 °
19	14.25	6	34.5	53 °
20	15	6	36	53 °

The formula is Depth X .75 X 2 Plus Bottom Width



Example:	If the depth in Type A soil is 10 feet Multiply: 10 feet by .75 multiply 7.5 by 2 (two sides) = 15 Add: 6 foot for bottom hole width 15 + 6 = 21 ft. Top width

NOTE: 6 foot bottom width is the normal width of a pipeline excavation in AL. FL. MS. Due to the width of the backhoe bucket normally used. The bottom width could be any size. No matter what the dimensions of the excavation the slope in type C soil has to be 53°degrees.

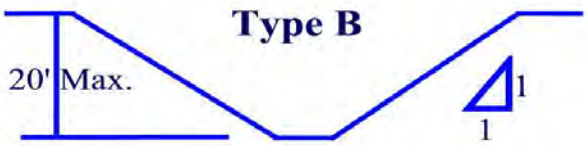
Excavation Slope Calculation Chart

Type B Soil

Trench Depth In feet	Length of slope in feet	Bottom Width in feet	Total Width at top in feet	Degrees to achieve 1 : 1
4	4	6	14	45
5	5	6	16	45
6	6	6	18	45
7	7	6	20	45
8	8	6	22	45
9	9	6	24	45
10	10	6	26	45
11	11	6	28	45
12	12	6	30	45
13	13	6	32	45
14	14	6	34	45
15	15	6	36	45
16	16	6	38	45
17	17	6	40	45
18	18	6	42	45
19	19	6	44	45
20	20	6	46	45

Over 20 feet depth requires professional engineer

The formula is Depth X 1 X 2 Plus bottom width



Example:	If the depth in Type B soil is 10 feet Multiply: 10 feet by 1 = 10 multiply 10 by 2 (two sides) = 20 Add 6 foot for bottom hole width 20 + 6 = 26 ft. Top width

NOTE: 6 foot bottom width is the normal width of a pipeline excavation in AL. FL. MS. Due to the width of the backhoe bucket normally used. The bottom width could be any size. No matter what the dimensions of the excavation the slope in type B soil has to be 45°degrees

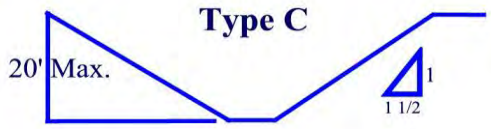
Excavation Slope Calculation Chart

Type C Soil

Trench Depth In Feet	Length of Slope In feet	Bottom width In feet	Total Width at Top in Feet	Degrees to Achieve 1:1 ½
4	6	6	18	34
5	7.5	6	21	34
6	9	6	24	34
7	10.5	6	27	34
8	12	6	30	34
9	13.5	6	33	34
10	15	6	36	34
11	16.5	6	39	34
12	18	6	42	34
13	19.5	6	45	34
14	21	6	48	34
15	22.5	6	51	34
16	24	6	54	34
17	25.5	6	57	34
18	27	6	60	34
19	28.5	6	63	34
20	30	6	66	34

Over 20 feet depth requires professional engineer

The formula is Depth X 1:1 ½ X 2 Plus Bottom Width.



Example:	If the depth in Type C soil is 10 feet Multiply: 10 feet by 1.5 = 15 multiply 15 by 2 (two sides) = 30 Add 6 foot for bottom hole width 30 + 6 = 36 ft. Top width

Note: 6 foot bottom width is the normal width of a pipeline excavation in AL. FL. MS. Due to the width of the backhoe bucket normally used. The bottom width could be any size. No matter what the dimensions of the excavation the slope in type C soil has to be 34° degrees.

03.6P-Energy Isolation (LOTO)

1.0 Scope

This procedure is applicable when any employee or contractor has the potential to be exposed to any of the following hazardous energy source(s) while conducting work on any GEL owned, leased or operated equipment:

- Any electrical, pneumatic, chemical, thermal or hydraulic operated machine or equipment.
- Any process or product line, valve, vessel or equipment containing flammable, corrosive or toxic gases/liquids or other type of stored/residual energy.
- Any radioactive sources (excluding NORM).

The procedural steps and the establishment of Isolation/Blind List described in this procedure in conjunction with an established procedure or job plan will be utilized to protect personnel working under Lockout/Tagout (LOTO).

Any job or work activities that meet the criteria of this energy isolation (LOTO) procedure but cannot be locked out and tagged due to abnormal situations or conditions, require approval of a variance. Equipment that has been placed “out-of-service” due to process control issues, quality issues, or decommissioned but still requires locks, will not utilize LOTO components for isolation and is not addressed in this procedure.

This procedure does not apply to work activity on cord and plug connected electric equipment where the equipment is controlled by unplugging the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

2.0 Purpose

The following HSSE procedure in accordance with the OSHA standard 1910.147 and 1910.333 establishes the minimum uniform requirements for the prevention and control of unexpected energizing or start-up of machines and equipment or releases of stored energy that could cause injury while work is being performed.

3.0 Procedure

3.1 Definitions

3.1.1 Affected Employee:

A Company or contract employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under LOTO, or whose job requires, work in an area in which such servicing or maintenance is being performed.

3.1.2 Authorized Employee:

A Company or contract employee who is trained and understands the process of lockout and tagout of machines or equipment in order to perform servicing or maintenance on a specific machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this procedure.

3.1.3 Energy Isolating Device:

A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

a. A manually operated electrical circuit breaker

b. A disconnect switch

c. A manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and in addition, no pole can be operated independently

d. A block valve

e. A Company approved LOTO device designed for use to block or isolate energy

CAUTION:

- **Push buttons, selector switches, and other control circuit type devices are a means to check energy isolation but WILL NOT be considered energy isolation devices.**

3.1.4 Isolation/Blind List:

A document (LOTO-100-Isolation/Blind List) used to specifically:

a. Identify each isolation point

b. Indicate the type of isolation action required such as valves blocked, and electrical disconnect, a blind installation, or other means of isolation the energy source

c. Identifies all employees associated with the particular LOTO

3.1.5 LOTO Components

a. Designated Individual LOTO Lock

1. Permanently issued metal locks (single key)
2. Assigned to authorized employees
3. Individual employee/contractor controls locks and keys
4. Applied to a specific equipment LOTO device
5. In multi-isolation point LOTO, applied to the group LOTO hasp, box or Job Board.

b. Lock box: The box into which the key, for the job lock(s) used, is secured by the Primary Authorized Employee*'s* personal lock and tag.

c. Job Board: The board, onto which the key for the job lock used is secured by the Primary Authorized Employee*'s* personal lock and tag.

d. Job lock:

1. Multiple locks (keyed alike, single key) applied to energy isolation points.
2. Controlled by the Primary Authorized Employee who implemented LOTO.
3. Lock(s) that will be identified and not used for any other purpose.

e. Tagout Device: A prominent warning device, such as a tag and means of attachment, which can be securely fastened to an energy isolation point.

3.1.6 Lockout: The placement of a job lock and tag on an energy isolating device, in accordance with and established procedure or Job Plan/JSA, ensuring the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

3.1.7 Primary Authorized Employee**:** A company employee designated as having the primary responsibility for implementation and coordination of the overall LOTO of hazardous energy sources for machine or equipment repair/servicing and the corresponding LOTO-100-Isolation/Blind List. The Primary Authorized Employee's personal lock is the ***first lock ON and the last lock OFF*** of the lock box or job board.

3.1.8 Principal Authorized Employee**:** A company or contract authorized employee who oversees or leads a group of servicing/maintenance employees and can be designated to verify the LOTO and will document verification by initialing next to each employee they are responsible for on the LOTO-100 – Isolation/Blind List.

3.1.9 Servicing/Maintenance: Workplace activities such as, but not limited to constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment.

3.1.10 Supervision: To be in charge of a group of people or work activities and ensures job tasks are completed safely and correctly.

3.1.11 Tagout: The placement of a Tagout device on an energy isolating device, in accordance with an established procedure or Job Plan/JSA, to indicate the energy isolating device and the equipment being controlled may not be operated until the Tagout device is removed.

3.1.12 Verify: To check whether or not something is true by examination, investigation or comparison

3.2 Responsibilities

3.2.1 Facility/Area Managers/Person in Charge (PIC):

a. Ensures Company employees are appropriately trained and follow company LOTO.

b. Ensures that Primary and Principal Authorized Employee(s) are designated for the facility that LOTO service or maintenance activities will be performed.

c. Ensures the isolation/blind list developed by the Primary Authorized Employee is accurately completed.

3.2.2 Primary and Principal Authorized Employee: This will be the person that has control of the LOTO system and will:

a. Perform an initial evaluation of the equipment being isolated

b. Notify affected employees and contractors of the application of energy isolation components

c. Isolate and/or lockout all identified energy sources

d. Complete each section of the LOTO-100-Isolation/Blind List as applicable, before work is performed.

e. Verify energy sources are controlled and/or isolated before beginning work by attempting to start the equipment or machine, if applicable.

f. Remove locks and tags upon completion of the work and ensure all sections of the LOTO-100-Isolation/Blind List are completed.

g. Notification to affected employees of the removal of LOTO components.

3.2.3 Authorized Employee:

a. Review the Isolation/Blind List and verify for accuracy.

b. Place personal lock with identification tag on the lock box or job board.

c. Complete Section E on the blind list by identifying department, craft/skill (e.g. Electrical, Mechanical, Welding) date and initial.

d. Remove personal lock, date and initial the “removed” portion of Section E of the LOTO-100-Isolation/Blind List once work is completed.

3.2.4 Affected Employees:

a. Follow guidelines set forth in this procedure

b. Do not tamper with locked or tagged systems,

c. Reminds others do not tamper with LOTO components.

3.2.5 Contractor:

a. Have and follow a written hazardous energy isolation plan that meets or exceeds the HSSE_3.6P – Energy Isolation (Lockout/Tagout).

b. Provide and use personal locks and tags that satisfy the Company procedure.

c. Ensure all contractor personnel are trained in hazardous energy control. Provide documentation upon request.

d. Designates a Principal Authorized Employee.

3.3 General Requirements

3.3.1 Protective Materials and Hardware

a. Each facility will have an adequate supply of job locks and tags that will be used solely for LOTO of energy sources.

b. Each lock must have a tag identifying the company/contractor employee who attached the lock/tag.

1. Tags are to be used in conjunction with the assigned job and personal lock(s)
2. Each authorized employee is responsible to ensure that their name and date is clearly written on their respective tags.

c. Locks and tags will be **durable** enough to withstand the environment to which they are exposed for the maximum period of time that exposure is expected.

1. Tagout devices will be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become impossible to read.
2. Tags will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

d. Lockout devices will be **substantial** enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

NOTE:
Plastic chains and plastic locks will NOT be used for any LOTO job.

e. Tagout devices, including their means of attachment, will be substantial enough to prevent inadvertent or accidental removal.

1. Tagout device attachment means will be of non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds; and

2. The Tagout device having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

f. Tagout devices will warn against hazardous conditions if the machine or equipment is energized and include a warning label such as the following: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.

3.3.2 Acceptable Energy Isolating Devices/Energy Isolation Points

There are several types of mechanical devices used to isolate equipment while work is being performed including, but not limited to:

a. Electrical source disconnects

b. Double block-and-bleed valves (i.e. twin seal valves) or a valve arrangement of two single in-line block valves with a drain, sample or vent outlet between the valves. (NOTE: the bleed valve will be left open and tagged)

c. Single block valves that provide a positive seal that can be verified. Single block valves must be blinded when required by a procedure, Job Plan/JSA or other HSSE procedure.

d. Shutter mechanisms “closed and locked” on fixed gauges containing radioactive sources

e. Air gapping by the removal of a spool piece or components with blind flanges placed as needed.

f. Isolation blinds (solid plate skillet or figure eight) – All blind applications (line, vessel, drum, etc.) will be identifiable ANSI rated blinds. However, unrated isolation blind(s) are acceptable **only** when ventilation point(s) are left open and tagged out in the open position to prevent pressure build up.

1. Blinds are installed to control the release of combustible or toxic liquids, vapors or gases during maintenance or construction.
2. A LOTO-100-Isolation/Blind List is prepared where blinds are utilized to ensure proper installation and removal; the list includes the location of blinds, applicable tagged vent/bleed valve, date installed, date removed, and appropriate initial/signatures.
3. Blinds are tagged for identification.
4. All blinds are removed when work is complete.

g. Specialized equipment such as stopple fittings and/or freeze plugs can be utilized if the installation is detailed in an existing procedure or in a Job Plan or JSA that has been approved by Operations, HSSE and Engineering.

CAUTION:

- **Never depend on check valves as an isolation point to prevent backflow of the contents in piping.**

3.3.3 Notification of Personnel

a. All "affected" employees will be notified by the Primary Authorized Employee prior to LOTO work being performed.

b. The Primary Authorized Employee will notify all Authorized Employee(s) (i.e. crafts, departments, groups, contractors, etc.) of the work to be performed and the type/magnitude of the energy hazard involved, but not limited to:

1. Electrical current/voltage
2. Hazardous characteristics of the product
3. Potential pressure involved
4. Mechanical action, **or**
5. Other energy potential

3.4 Long Term LOTO

3.4.1 Long Term LOTO is put into place when equipment has been placed "out of service" due to process control issues, quality issues and/or decommissioning, but still requires locks. The long term LOTO, is an Operations driven process that is completely separate from Maintenance LOTO.

3.4.2 Long term LOTO requirements:

a. Seals with facility name and serial number

b. Long term LOTO seal log

c. Annual review of equipment placed in long term LOTO

d. Annual review of seals

NOTE:

When an isolation point that has been previously placed in long term LOTO becomes part of a maintenance LOTO operation, the long-term seal or lock can be left in place but an additional maintenance LOTO lock and tag MUST be used to secure the isolation point. After the maintenance LOTO is removed, the isolation point can be left in long term LOTO if needed.

3.5 Energy Isolation

3.5.1 *The* Primary Authorized Employee will survey equipment and prepare an LOTO-100-Isolation/Blind List identifying all isolation points associated with the equipment and/or system to be taken out of service as follows:

a. Perform an initial evaluation utilizing P&ID's, construction drawings, equipment drawings, alignment sheets and/or field verification.

b. Complete Section A on the LOTO-100-Isolation/Blind List reflecting the sequence of steps to properly isolate the equipment, machine or process.

c. Complete Section B on the LOTO-100-Isolation/Blind List listing the isolation devices to be used for each of the steps listed in Section A.

d. Complete Section C on the LOTO-100-Isolation/Blind List identifying the methods for preparation of the equipment, machine or process listed in Section A.

3.5.2 The Primary Authorized Employee will:

a. Go to each energy isolation point listed on the LOTO-100-Isolation/Blind List and verify that job locks and tags have been applied.

b. Place his/her initials in Section D on the LOTO-100-Isolation/Blind List to verify that job locks and tags have been installed on all energy isolating device(s)

c. Verify that isolation and de-energization of the machine or equipment has been accomplished by attempting to start the equipment or machine.

d. Sign the LOTO-100-Isolation/Blind List confirming job locks are installed and Sections A – D are complete.

e. Secure the job lock key in the lock box or on the job board by placing their designated individual LOTO lock and tag on the lock box or job board.

f. Complete and sign the first line of Section E confirming personal lock is installed as "First Lock On".

CAUTION:

- **Only a qualified employee will perform disconnects of 600 volts and above or any de-energizing activities that will require opening of the switchgear door, cover of other protective device, reaching into and/or entering the equipment in any manner.**
- **Refer to HSSE Procedures Manual Section 3.2 – Electrical Safety**

3.5.3 A Principal Authorized Employee can be utilized when a group (i.e. contractor, crew, craft, department, etc.) is involved in servicing/maintenance as follows:

a. Will verify that all equipment is properly locked & tagged out as per the LOTO-100-Isolation/Blind List.

b. Will verify that isolation and de-energization of the machine or equipment has been accomplished.

c. Once verification is complete, initial next to his/her name and next to each authorized employee's name for which he/she is performing verification in Section E of the LOTO-100-Isolation/Blind List.

d. Will apply personal lock and tag to the lock box or job board.

3.5.4 Each Authorized Employee (Company or Contractor) prior to performing servicing and/or maintenance on the equipment will:

a. Verify that all job locks and tags have been placed, by the Primary Authorized Employee, on all isolation points per the LOTO-100-Isolation/Blind List, unless a Principal Authorized Employee has been utilized.

b. Verify that isolation and de-energization of the machine or equipment has been accomplished, unless a Principal Authorized Employee has been utilized.

c. Verify the job lock key is secured in the lock box or on the job board.

d. Attach his/her personal lock and tag on the lock box or job board.

e. Place his/her initials and date in Section E of the LOTO-100-Isolation/Blind List, to verify that his/her personal lock and tag has been installed on the box or job board.

CAUTION:

- **Only a qualified and/or licensed contractor will do any repairs, relocation or removal of radioactive material sources.**
- **Refer to HSSE_6.10P – Radiation Safety.**

3.6 Release from Logout/Tagout

Before Lockout or Tagout devices are removed and energy is restored to the equipment, the Primary Authorized Employee will ensure the following action in the sequence stated:

a. Employees performing/completing the job will inform the Primary Authorized Employee that the work has been completed and personal locks and tags have been removed from the lock box or job board.

b. The Primary Authorized Employee determines that the work was completed properly and that system integrity is correctly restored as follows:

1. The work area is cleared of nonessential tools and equipment not needed for the startup of equipment.
2. The work area should be clean of all excess work material and debris.
3. All personnel will be in a safe position before commission of equipment is continued.
4. Guards removed for work are put back in place.
5. All appropriate signage is where it should be.
6. Any equipment that was locked into a fixed position to prevent movement (e.g. gravity, loss of hydraulic or pneumatic pressure) is returned to its normal operating position.

c. The Primary Authorized Employee verifies that the controls are in the neutral or off position.

d. The Primary Authorized Employee verifies that all Authorized Employees personal locks and tags have been removed from the lock box or job board and verifies that all authorized employees have signed off on the LOTO-100-Isolation/Blind List.

e. **Last lock/tag Off** – The Primary Authorized Employee removes his/her personal lock and tag from the lock box or job board.

f. The Primary Authorized Employee removes the job lock key from the lock box or job board and removes job locks from each energy isolation point per LOTO-100-Isolation/Blind List and initials the same.

g. The Primary Authorized Employee notifies affected employees that the work is completed and the equipment is ready for use.

3.7 Shift or Personnel Change

3.7.1 When the work continues into the next shift the Primary Authorized Employee going off shift will transfer authority to the oncoming shift's Primary Authorized Employee after field verification is completed and all isolation points listed on the LOTO-100-Isolation/Blind List.

a. The Primary Authorized Employee will ensure that all pertinent coordination between off-going and-oncoming personnel has been completed before the on-coming authorized personnel begins work on the machine or equipment and that all necessary energy has been rendered safe.

b. The Primary Authorized Employee going off shift will remove his/her personal lock and tag from the lock box or job board **only** after the

oncoming Primary Authorized Employee has placed his/her personal lock on the lock box/job board.

c. Transfer of authority will be documented in Section F of the LOTO-100-Isolation/Blind List

3.7.2 When the work does not continue into the next shift **NO** transfer of the Primary Authorized Employee is required.

NOTE:
The lock box or job board will always have a Primary Authorized Employee's personal lock and tag applied until the job is complete.

3.8 Designated Individual LOTO Lock Removal

When an Employee who applied their LOTO lock and tag to the lock box or job board is not available to remove it, that lock may be removed under the direction of Supervision using the following steps in conjunction with the LOTO-101-Emergency Removal of Locks**.**

CAUTION:

- **Unauthorized removal of any lock or tag is strictly forbidden and may result in disciplinary action.**

3.8.1 Remove the lock and tag after demonstrating the following:

a. Review the scope of work, verify that no additional hazards or exposures exist and that it will be safe to remove the lock and reactivate the equipment.

b. Verify that the authorized employee, who left the lock on is not at the facility.

c. All reasonable efforts to contact the authorized employee have been made to inform him/her that their lock and tag will be removed.

d. Consult with the Regional HSSE Manager/Coordinator.

3.8.2 The Facility/Area Managers/Person in Charge (PIC) will ensure that the authorized employee, whose lock and tag was removed is informed when he/she resumes work at the facility.

3.8.3 A notation of each lock and tag removed will be made on the affected Isolation/Blind List, in Section E, and will be initialed by the Company employee involved in removing the lock.

a. The above steps will be documented on LOTO-101-Emergency Removal of Locks**.**

b. The form will be kept at the facility in the facility safety file. (Store the completed forms at the facility for one previous year and current)

3.9 Testing or Positioning of Machines

3.9.1 The temporary removal of locks or tags and the re-energization of the machine or equipment can be done **ONLY** when special conditions warrant it (e.g. when power is needed for the testing or positioning of machines, equipment or components.)

3.9.2 The re-energization must be conducted in accordance with the sequence of the following steps:

a. Clear the machine or equipment of tools and materials

b. Notify and remove affected or authorized employees from the machine or equipment area.

c. Remove the lock(s) & tags(s) as specified and note in the comments section of the Isolation/Blind List as required.

d. Energize and proceed with testing or positioning.

e. When testing or positioning is complete deenergize the system, isolate the machine or equipment from the energy source and reapply lock(s) and tag(s) as specified.

f. Notify affected and authorized employees that the machine or equipment is back under LOTO.

3.10 Periodic Inspection General Requirements

3.10.1 The Facility/Area Managers/Person in Charge (PIC) will ensure that a periodic inspection of the energy isolation procedure is performed **at least annually** of an ongoing job to ensure that the procedure and the requirements of this procedure are being followed.

3.10.2 Document the inspection of this procedure on LOTO-102-Review of Energy Isolation Procedures form to include:

a. Identification of the machine or equipment on which the control plan is utilized.

b. The date of the inspection.

c. The name(s) of employee(s) included in the inspection.

d. The person performing the inspection.

e. Any deviations or inadequacies found and corrective actions taken which may include retraining as per 3.10.5.

3.10.3 The periodic inspection will be performed by an Authorized Employee other than the one utilizing the energy control procedure being inspected.

a. The periodic inspection will be conducted to correct any deviations or inadequacies identified.

b. Where lockout is used for energy control, the periodic inspection should include a review between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

c. Where tagout is used for energy control, the periodic inspection should include a review between the inspector, each authorized employee, and each employee's responsibilities under the energy control procedure being inspected.

3.10.4 Communicate the results of the periodic inspection to all employees involved with the job being reviewed.

3.10.5 Periodic inspections will cover a representative sample of the various jobs that use an energy control procedure during the year.

3.11 Employee Training and Communication

3.11.1 The Company will provide **initial and annual** training to ensure that the purpose and function of the energy isolation (LOTO) program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees.

a. Perform an initial evaluation of the equipment being isolated

b. Notify affected employees and contractors of the application of energy isolation components

3.11.2 Primary and Principal Authorized Employee: Training will include:

a. Requirement of this procedure and associated standards.

b. Fundamentals of reading a process drawing.

c. Development of machine or equipment shut-down procedures.

d. Hazards associated with energy sources.

3.11.3 Authorized Employees - Training for Authorized Employees will include:

a. The recognition of locations, types and magnitudes of potential hazardous energy sources in the work area.

b. Proper LOTO procedures and use of Lock Box or Job Board.

c. Proper use of lock(s) and limitations of properly utilized tag(s).

d. Requirements of Primary Authorized Employee.

3.11.4 Affected Employees – Training for Affected Employees will include:

a. Instruction in the purpose and use of this HSSE procedure.

b. How to recognize a lock, tag, lock box, and/or job board.

c. Understanding the importance of **NOT** tampering with LOTO components and **NOT** attempting start-up or using equipment that has been locked or tagged out.

3.11.5 Employee Retraining – Retraining will be provided for all Authorized and Affected employees whenever:

a. There is a change in their job assignment.

b. A change in machine, equipment or process presents a new hazard.

c. There is a change in this HSSE procedure.

d. A periodic inspection reveals an issue, or whenever the Company has reason to believe that there are deviations from the procedure, or inadequacies in the employee's knowledge or use of this procedure.

3.11.6 Training will be documented/retained and made available upon request.

4.0 References and Revisions

4.1 References

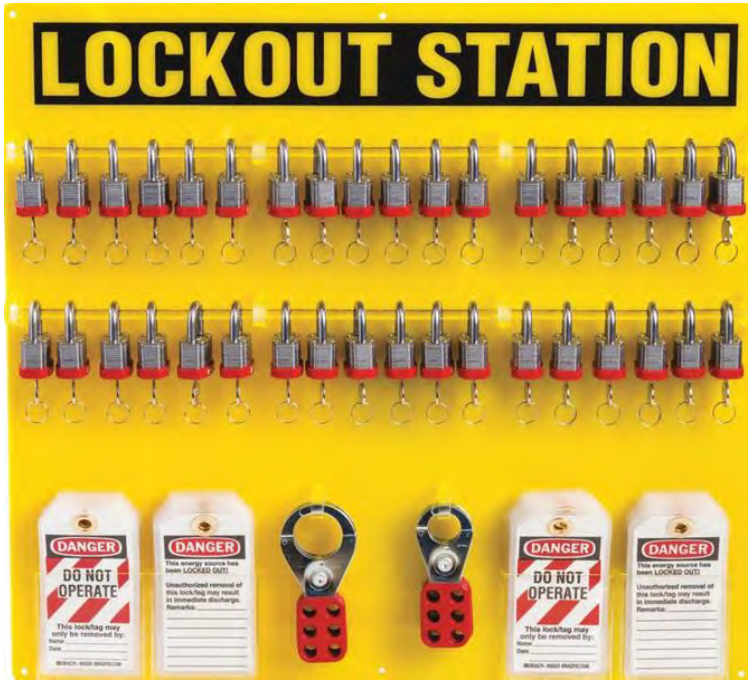
4.1.1 29 CFR 1910.147

4.1.2 29 CFR 1910.147 Appendix A

4.2 Revisions

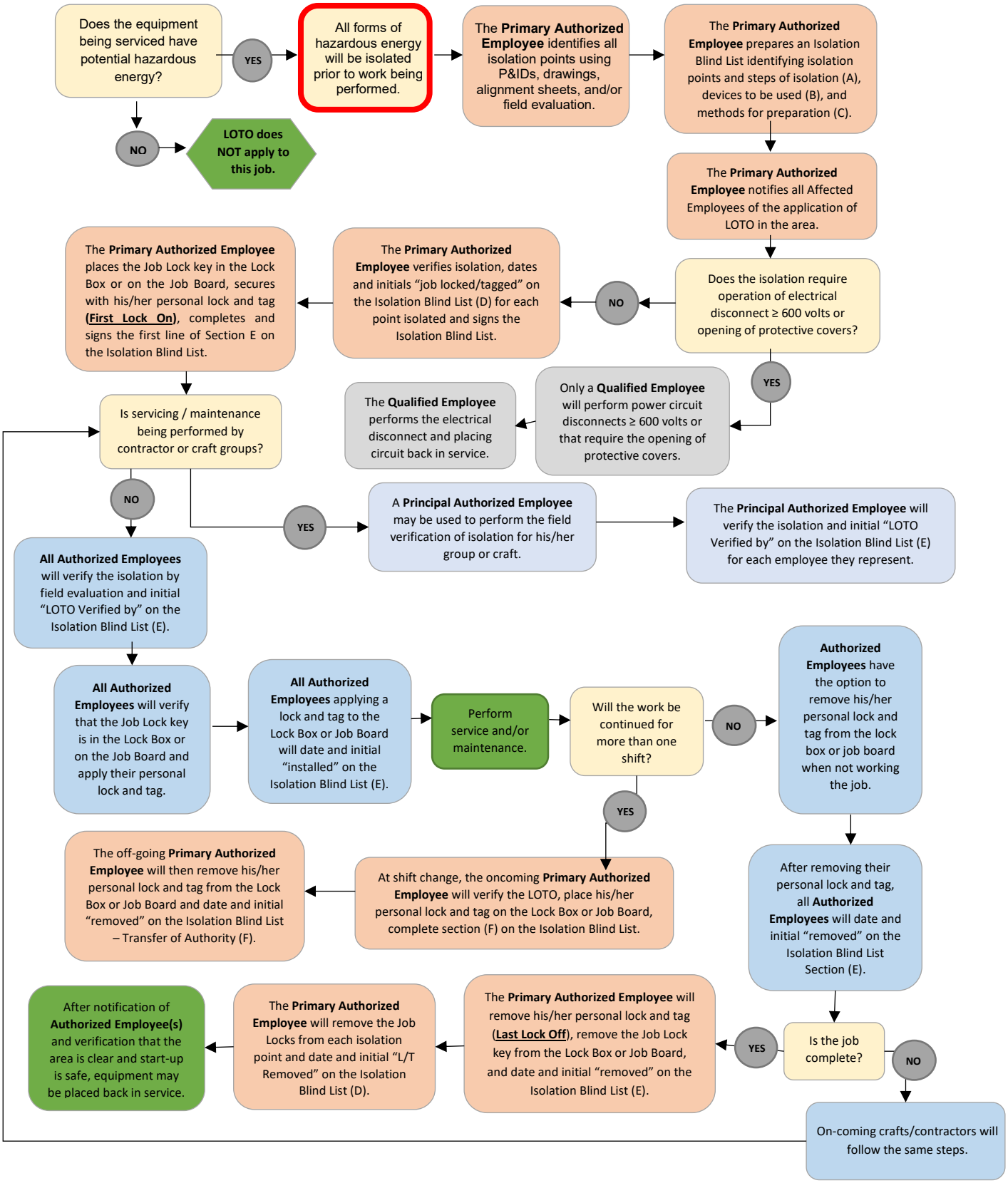
Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
12/01/2017	All	Complete revision of LOTO procedure and forms
12/20/2022	3.1.5(e) 3.2.2(e) 3.4 3.6(b)(4-6)	Move 3.1.12 to 3.1.5(e) Add: by attempting to start the equipment or machine New section – Long Term LOTO Add steps to complete proper return of service

Appendix A. Example Job Board



Appendix B. Example Lock Box

Appendix C. Lockout/Tagout Flow Diagram



03.12P-Perparation of Equipment and Systems for Maintenance and Repair

1.0 Scope

The Scope of this procedure covers the removal of natural gas, natural gas liquids (LPG/NGL), refined products, crude oil, and other hazardous materials from all equipment and systems intended to be opened to the atmosphere for maintenance, inspection or repair. This procedure applies to all operational business units.

2.0 Purpose

- This procedure establishes the minimum requirements for the removal of hydrocarbons, toxics and pyrophoric materials from equipment and piping systems prior to maintenance, repair or modification. In addition, several practices are described that shall be considered when planning this type of work.

3.0 Procedure

3.1 Definitions

3.1.1 **Blinding**: The absolute closure of piping, pipeline, or duct by the fastening of a solid plate (such as a spectacle or skillet blind) that completely covers the bore such that the closure is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

3.1.2 **Confined Space**: A space that is large enough and so configured that a worker can bodily enter and perform assigned work. The space has limited or restricted means for entry or exit (for example, tanks, vessels, storage bins, hoppers, vaults, and pits) and is not designed for continuous employee occupancy.

3.1.3 **Double Block-and-Bleed:** The closure of a line, duct, or pipe, by locking closed and tagging two in-line valves, locking and tagging a drain or vent valve fully open to the atmosphere in the line between the two closed valves. Double isolation of two closed valves can be achieved by utilization of double isolation-and-bleed valves.

3.1.4 **Double Isolation-and-Bleed:** A single valve with two seating surfaces, each of which, in the closed position, provides a seal against pressure from a single source, with a means of venting/bleeding the cavity between the seating surfaces.

3.1.5 **Energy Isolation Points:** A term used to describe any of the various Energy Isolation Devices as defined in *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout).*

3.1.6 **Entry**: The action by which a person passes through an opening into a confined space. Entry into a confined space is considered to have occurred when any part of the entrant's body breaks the plane of an opening into the space.

3.1.7 **First Line Break:** The first physical opening or first breaking apart of process systems which contained an energy source, or a hazardous material. This includes unscrewing, unbolting flanges, cutting into pipelines or process equipment and includes blind removal. Excluded are hose connections that are used routinely for loading/unloading operations (such as railcars and tank trucks), disconnecting instrument, analyzer laboratory tubing, hot-bolting, 4-bolting, removing a plug from a line, and taking samples at sample points designed for process sampling.

3.1.8 **Hazardous Atmosphere:** An atmosphere that may expose a worker to the risk of death, incapacitation, and impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:

a. Flammable gas, vapors, or mist at a concentration that exceeds 10% of its Lower Explosive Limit (LEL).

b. Airborne combustible dust at a concentration that meets or exceeds its Lower Flammability Limit (LFL), or that obscures vision at a distance of 5 feet.

c. Atmospheric oxygen concentration below 19.5% or above 23.5%.

d. Any toxic material or substance in concentrations above the Permissible Exposure Limit (PEL).

e. Any other atmospheric condition that is immediately dangerous to life or health.

3.1.9 **Hot Bolting:** The practice of removing and replacing or freeing and re-tightening a bolted connection while the bolted joint assembly (flange/heat exchanger/manway) is on live piping and equipment in operation.

3.1.10 **Internal Smart Plug:** A remote-controlled pipeline isolation tool, with double block and monitor capabilities. The smart plug works on a smart pig platform. It is designed to withstand maximum allowable operating pressure so that repairs can be carried out while pipeline pressure is maintained. The two independent plug modules travel on a spring-loaded wheel system and can isolate the full pipeline pressure, thus allowing a double-block isolation anywhere in the pipeline. Manufactured by TD Williamson.

3.1.11 **Internal Smart Vent:** The system, similar to isolation tools designed specifically for the application, isolates and vents vapors away from the workstation during pipe repairs. Oceaneering's Smart Vent Safety System is an example.

3.1.12 **Lower Explosive Limit (LEL):** the lowest concentration in air that flammable vapors could ignite.

3.1.13 **Naturally Occurring Radioactive Material (NORM):** Any material that is radioactive in its natural physical state (i.e., not man-made) but does not include by-products, source or special nuclear material.

3.1.14 **Permissible Exposure Limits (PEL):** Time-weighted average (TWA) concentrations that shall not be exceeded during any 8-hour work shift of a 40-hour work week.

3.1.15 **Personal Protective Equipment (PPE):** Specialized clothing or equipment worn by an employee for protection against a hazard.

3.1.16 **Self-Contained Breathing Apparatus (SCBA):** a respirator for which the breathing air source is supplied and carried by the user.

3.1.17 **Subsequent Line Break:** Any and all subsequent break(s) after the First Line Break within permitted equipment.

3.1.18 **Verify:** To perform or witness in the field a task which provides assurance or confirmation.

3.1.19 **Zyme-Flow UN657:** A chemical cleaning agent represented by the manufacturer to "*remove residual oil, gas, benzene, LEL, H_2S, and pyrophoric iron sulfide*" Zyme-Flow UN657

3.2 Job Planning

3.2.1 Either a written Procedure or a Job Plan covering the work to be performed shall be in place and followed. The applicable sections of this procedure shall be covered in the Procedure or Job Plan.

a. Proper scheduling and communication shall be performed with all applicable stakeholders:

i. Involved Operations and Maintenance Personnel
ii. Operations Control Center
iii. Commercial and Distribution Departments
iv. Land Right-Of-Way Department
v. Environmental Department
vi. HSSE Department
vii. Others as they apply

NOTE:

- Isolation Points do not always hold. Discuss possible schedule delays during Pre-Job meeting(s) with these groups regarding the potential need to expand isolations as needed.

b. Involve the employee(s) assigned to prepare the equipment in the planning step whenever possible.

c. The employee(s) performing the work shall review the entire procedure or job plan prior to commencing work.

d. Job Plans shall be in accordance to *GEN_HSSE_03.14P – Job Plan.*

3.2.2 Employee(s) involved in preparing the equipment, and/or system shall review the hazards and characteristics of the product(s) involved.

a. Refer to the Safety Data Sheets (SDS)

b. The items below will be evaluated when identifying potential hazards:

i. Flammable and Combustible Liquids or Gases
ii. Corrosive Liquids or Gases
iii. Nitrogen (asphyxiant)
iv. Benzene, H_2S, Mercury, NORM (toxic)
v. Pyrophoric materials

c. Identify proper PPE in accordance with *GEN_HSSE_04.2P – Personal Protective Equipment (PPE).*

3.2.3 The Employee(s) responsible for performing the preparation of equipment and systems shall conduct a field walk-down to review the isolation points utilizing drawings in accordance with *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout).*

3.2.4 Identify the location of valves that will be utilized (e.g. existing highpoint vents and low-point drains, risers, Threaded-O-Rings, etc.)

3.3 Operational Preparations Prior to Isolation

The Company requires operational practices to improve safety, minimize potential exposure to employees, reduce the amount of product loss (vented/flared), and improve the efficiency of the clearing process.

This section is intended to identify options for the removal of products or contaminants from the equipment or system prior to closing valves and performing the energy isolation step.

The practices described in this section shall be considered, and those that apply be identified in associated Procedure(s), Job Plan(s), and applicable Job Safety and Hazard Analysis (JSHA):

3.3.1 Displacement of Product (e.g. reduce H_2S, Benzene content, vapor pressure, etc.)

3.3.2 Reduce product levels in tanks or vessels to the lowest attainable level

3.3.3 Reduce pressure to the lowest attainable level

3.3.4 Procedures shall include step(s) to reach ambient temperatures without shocking or damaging the equipment

3.3.5 Pigs may be used to make clearing more effective by removing the liquid hydrocarbons and other contaminants from a pipeline system or line segment.

3.3.6 Installation of temporary Pig Traps, Threaded-O-Rings (TOR), or Stopples may be required in some piping configurations.

3.4 Energy Isolation

Energy Isolation is the process of securing energy sources in conjunction with Draining and De-pressuring.

3.4.1 Energy Isolation shall be performed in accordance with *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout).*

3.4.2 Energy Isolation Points shall be checked to ensure they are holding and not leaking. This can be performed by various methods utilizing gauges and reducing pressure or levels, venting spaces between double block-and-bleed, or other methods.

a. The equipment or system should be observed long enough (15 minutes minimum) to verify the isolation point(s) are holding. Increase the observation time as needed considering the pressure differential and isolated system volume.

NOTE:

- Coldness or frost may be an indication that product is leaking.

3.4.3 If the initially defined isolation points are not holding, an alternative isolation location or method shall be established. The associated Job Plan or Procedure shall be revised as needed, and the Stakeholders notified for approval.

Examples of alternative isolation might include:

a. Perform isolation valve maintenance (e.g. adjustment, greasing or sealant)

b. Isolate at another valve in the piping system if the initial valve does not hold

c. Utilize a stopple.

NOTE:

Certain precautions apply when using a stopple for isolation.

- Refer to the following for additional requirements as they apply: Genesis Energy Engineering Standard STD.8012 Welding Hot Taps.
- Contract workers involved in performing the hot tap, and stopple setting, are required to remain at the immediate work site until the line segment is de-pressured and verification is made that the stopple has been properly set.

d. Install a blind. A blind is the preferred means for isolation**.** – Refer to Blinds, 3.8.7 of this procedure, for information on First Line Breaks and Blinding.

e. If coldness or frost is observed at a stopple, remove and examine the cup for cuts/damage then re-set. If 0% LEL at the stopple location cannot be achieved, an additional stopple or other means of isolation may be required**.**

f. For Pigging Operations – if a Pig Trap isolation point has a small leak, stop work and review controls and countermeasures with Operations Supervisor and HSSE Manager / Coordinator for approval before proceeding.

3.4.4 Energy Isolation of some piping configurations may require the installation of Stopples and/or TOR's to achieve isolation.

3.5 Draining and De-pressuring

Venting hydrocarbons directly to the atmosphere should be avoided. Once isolated, de-pressure the system through a flare or vent system appropriate for the product in adherence with Environmental requirements.

3.5.1 Use the system pressure to assist in draining residual liquids. Verify the system is completely drained utilizing available low point drains.

3.5.2 Verify de-pressurization with appropriately rated pressure gauges and confirm visually by opening a bleeder. Make sure the gauges are not plugged. Valve body bleeds may need to be opened to relieve trapped pressure.

NOTE:

- Connections made to the system shall be selected and rated based on manufacture/engineering data for use in the operating range of pressures expected to be encountered. Each system connection made in the field will be verified to ensure integrity of the connection to hold pressure prior to operational activities such as hydro testing. Connections should be monitored (15 minutes minimum) to visually verify connection point(s) are holding.

3.5.3 Hoses, tubing, fittings and any other temporary connections used during venting and draining shall be appropriately rated for the product and pressure of the system.

3.5.4 Temporary hoses, tubing, and fittings connection points shall be secured in a manner that minimizes the hazards associated with “Whipping” due to inadvertent line failures. Hose whip restraints or line securement chokers methods (such as Tuflex Hose Halters, Cable Whip Hose Choker or Hose Hobbles) shall be utilized.

3.5.5 Position portable flares at least 50 feet downwind and/or crosswind from the work area, away from all combustibles. Vehicles shall be detached and relocated outside of the area.

WARNING:

- **THE CRYOGENIC EFFECT OF SOME PRODUCTS CAN RESULT IN LIQUIDS IN THE SYSTEM. THIS CAN RESULT IN A FALSE INDICATION THAT THE PIPING IS CLEAR.**

3.5.6 Venting to atmosphere is allowed for **Natural Gas Systems** once the residual liquids are removed, provided the following requirements are met:

a. Shut-down all work in the immediate area and remove nonessential personnel

b. Secure the area around the vent, and restrict entry for a minimum of 35 feet, additional distance may be needed depending on wind speed, direction, and volume being vented.

c. Monitor the wind direction and conduct atmospheric monitoring of the vent perimeter

d. Venting is not allowed near populated areas (e.g. schools, hospitals, apartments, subdivisions, offices, highways). Flares shall be used in this application. Noise and odor are additional concerns.

e. Never vent to the atmosphere from inside an excavation, near power lines, or other ignition sources

3.5.7 Practices for Removing Liquids:

a. Identify necessary drain valves and install ahead of time if possible

b. Use Dip-Tubes and stingers to assist with the draining process as needed.

c. Vacuum trucks may be used on certain types of liquids. Job Plans shall include specific precautions required when utilizing vacuum trucks. VT-100 – Vacuum Truck Checklist must be completed prior to vacuum truck operations.

d. Nitrogen may be used as a pressure source to push the liquids from the system.

i. Check valves are required to prevent backflow into the nitrogen source

ii. Prevent (as much as possible) the nitrogen from skipping over the liquid

e. Water, steam or chemical cleaning methods may be used to float or clean hydrocarbons from the system. Contact the Environmental Department in advance to make allowances for disposal.

f. Do not use compressed air to push pigs when clearing flammable gas and liquids.

3.5.8 Dispose of liquids by transferring them to a compatible system, flare knock-out drum, or an atmospheric tank (sump or frac tank), for relocation.

3.5.9 Requirements for atmospheric tanks (sump or frac tank) used to store flammable liquids:

a. The level shall be monitored to prevent overfilling

b. The tank shall be within a containment area. Temporary containment liners are available for frac tanks

c. The tank shall be vented and grounded. Contact the Environmental Department to identify additional requirements (e.g. carbon absorbers, etc.)

d. Perform periodic atmospheric monitoring (LEL) around the tank, and install barricades to restrict access to prevent ignitions sources. Adjust the barricade perimeter as necessary to ensure 0% LEL outside the barricaded area.

e. The wind direction shall be monitored

3.6 Purging

After draining and de-pressuring, Purging is the process of removing flammable, combustible, or toxic gas and any final remaining liquids. This process is intended to completely remove the flammability and toxics; Authorized Representative will consult Supervision before proceeding if LEL is between 0-10%.

3.6.1 If Flammability of 0-10% LEL or Toxics below the PEL is not achieved, additional precautions shall be identified, and approved by both Operations and HSSE before proceeding.

CAUTION:

- **Handheld gas detectors <u>cannot be used</u> for LEL testing in atmospheres that are inert unless: The equipment is designed for inert applications, or the test is performed just outside of vents or other "openings" where oxygen (air) is mixed with any escaping gases or vapors. Comply with the manufacturer's recommendations for checking inert atmospheres.**

3.6.2 Prior to performing covered tasks within a PHMSA regulated pipeline facility; verify personnel performing purging are qualified for the task and have the proper Operator Qualification (OQ) documentation.

3.6.3 Nitrogen is the preferred purging medium:

a. Dry ice (CO_2) is effective when purging very small segments.

b. Steam is effective in facilities and aids in removing light ends.

c. Water can be used as a purge medium only in accordance with disposal and environmental compliance requirements.

d. Avoid using compressed air as a purge medium in processes where hydrocarbon containing materials are present.

3.6.4 Purging with air movers:

a. Shall only be performed by trained or OQ qualified employees or Third Party personnel.

b. Is allowed to purge atmospheric storage tanks per API RP 2016.

c. Is NOT allowed where there is a known potential for pyrophoric contaminants. See 3.7.3 of this procedure for information on where pyrophoric materials can be found.

3.6.5 Exceptions to purging are identified in 3.6.11(C) of this procedure.

3.6.6 Inert purging of LPG/NGL Pig Traps is required.

3.6.7 The purging method shall be identified in the Procedure or Job Plan.

3.6.8 Follow the Inert Purging guidelines below depending on the method:

a. Pressure/De-Pressure (*dilution*) – most effective method

i. Provide over pressure protection
ii. Identify the injection point ahead of time
iii. Pressure equipment/pipeline segment to 40-50 psig minimum with inert gas.
iv. De-pressure at farthest point possible from the injection point to a flare or vent until near 0 psig.
v. Perform this technique 3 times and test to see if LEL is between 0 and 10%. Repeat as needed.

NOTE:

- 0% LEL must be obtained before Confined Space Entry or Hot Work can be performed.

vi. Hot inert gas may be needed to remove residual liquids.

NOTE:

- Hot nitrogen cools in segments beyond 400-500 feet.

WARNING:

- **SYSTEM EQUIPMENT DESIGN TEMPERATURES AND PRESSURES SHOULD BE COMMUNICATED TO THE NITROGEN VENDOR AND SHALL NOT BE EXCEEDED. NITROGEN VENDOR SHALL PROVIDE OVERPRESSURE PROTECTION.**

b. Inert Sweeping – Not as effective as dilution method

i. Inject nitrogen into one end of the piping or equipment, allowing it flow or sweep through and vent from the system's farthest point until the flammable contents have been removed
ii. Consider the need for continual nitrogen sweeping during maintenance to maintain a positive pressure, inert atmosphere, or prevent moisture entrainment.

c. Inert Slug (*displacement*)

A nitrogen "slug" is a quantity of nitrogen or inert gas loaded into a pipeline then followed by the combustible gas used to push the Inert Slug.

The Inert Slug is used to prevent formation of a combustible mixture during purging without filling the entire length of pipe with the inert gas.

i. Calculate the required quantity of nitrogen (inert gas) using the table in Appendix A - Nitrogen (Inert gas) Slug and Purge Requirements of this procedure.
ii. A pig may be used to better define and maintain separation between the inert material and product interfaces.
iii. Do not use air to push the pigs if there is a potential for hydrocarbon interface.
iv. Vent or flare the inert material prior to its arrival to a facility to prevent damage to equipment or process upsets.

3.6.9 Other Purging Methods

Other methods of purging may be used on a case-by-case basis if approved by the Corporate Technical Services Group, Operations and HSSE.

WARNING:

- **NITROGEN IS AN ASPHYXIANT AND SHALL BE VENTED TO A SAFE LOCATION.**

3.6.10 Purging Crude Oil and Condensate Systems

a. After drained and de-pressurized, a minimum of one nitrogen sweep shall be performed to remove light-ends from the line. Chemical cleaning agents may be used to lower the LEL in addition to the nitrogen sweep.

b. Refer to the First Line Break requirements in 3.8 of this procedure.

c. Continue use of nitrogen and/or application of chemical cleaning agents as needed to reduce LEL inside the piping while work is being performed.

d. If Air Movers are used to reduce LEL, 3.10.5 of this procedure shall be followed.

e. Supplied air respirators shall be worn by workers during plug installation if 0-10% LEL or if toxics less than the PEL cannot be achieved in the work area.

3.6.11 Opening Equipment or Systems to Atmosphere without Purging

Allowing equipment or parts of a pipeline segment to weather or air-out is allowed when enough time is permitted for the equipment to lay dormant, allowing natural atmospheric conditions to displace the contaminants. This

is only effective and allowed on smaller equipment and short piping sections (e.g. pup joints).

a. Atmospheric venting of hydrocarbons and the practice of opening equipment or piping to the atmosphere to allow weathering of liquid hydrocarbons should be avoided.

i. This practice, if determined necessary, shall be approved by Operations, HSSE and Environmental.
ii. Perform periodic atmospheric monitoring (LEL), and install barricades to restrict access to prevent ignitions sources. Adjust the barricade perimeter as necessary to ensure 0% LEL outside the barricaded area. The system shall be checked to ensure LEL and Toxics are removed prior to work. Refer to Verification Testing, 3.12 of this procedure.

b. Equipment and piping containing some Crude Oil products may drain sufficiently so that purging is not necessary.

i. Systems containing high Reid Vapor Pressure (RVP) (refer to Facility Crude Quality Specifications) products or high H2S (greater than 10 ppm) products require Purging.
ii. If gravitational draining or vacuum trucks do not adequately remove the product; then purging, plugs, and air movers may be needed.

c. Exceptions to Purging include:

i. Natural Gas or Crude Oil Pig Launchers and Receivers
ii. Short Natural Gas meter runs
iii. Natural Gas Compressors
iv. Refer to Appendix B Purging Flow Chart for details
v. Other exceptions shall be reviewed and approved on a case-by-case basis (no blanket approvals) by Operations and HSSE.

3.7 Cleaning

After the equipment or system has been completely isolated, de-pressured and purged, additional cleaning may be needed to remove any remaining toxic, NORM, or pyrophoric materials.

3.7.1 For piggable systems, scraper pigs are used prior to isolation to remove these deposits.

3.7.2 Volatile or flammable liquids, toxic, NORM, and pyrophoric materials that become entrained in solids, sludge or scale shall be removed by cleaning.

3.7.3 Pyrophoric Material

a. Pyrophoric material typically appears as a fine solid powder or rouge deposit in piping or equipment and can be entrained in sludge.

Pyrophoric material can be found in filters, scrubbers, piping, pig traps and other equipment.

b. Pigging operations are effective in removing the material from piggable piping systems. Chemical cleaning is an alternative method for non-piggable piping.

c. An effective cleaning method for equipment such as pressure vessels, tanks, and filters is to fill the closed container with chemical cleaning agents, circulate and/or agitate with nitrogen or other methods to suspend the solids, then drain to remove the solids. This process is repeated until the equipment is cleaned.

d. Care shall be taken when removing these solids to keep them wetted until they can be completely neutralized.

WARNING:

- **IF NOT PROPERLY WETTED, THE PYROPHORIC MATERIALS MAY IGNITE SPONTANEOUSLY IF EXPOSED TO AIR.**

3.7.4 The Environmental Department shall be contacted in advance to make allowances for disposal of contaminants.

3.7.5 Cleaning strategies:

a. Agents

i. Additives such as Zyme-Flow UN657 (or equivalent) are designed to neutralize sulfide components permanently removing their pyrophoric nature.
ii. Micro-Blaze (several different types of surfactants), and other agents break down, degrade, and digest organic waste while also controlling vapors and eliminating flammability.
iii. Steam
iv. Water wash (marginally effective)

b. Method

i. Soaking
ii. Circulation
iii. Circulation with Heated Material
iv. Agitation
v. Spray on
vi. Keeping Wetted

c. Specialty Chemical Cleaning Companies

i. GEL requires a Master Service Agreement (MSA) with Specialty chemical companies, and the cleaning method shall be identified and approved in the procedure or Job Plan.

3.8 First Line Break

This section applies to First Line Breaks associated with opening and blinding of piping systems or equipment where the potential release of energy or hazardous materials exists.

First Line Break examples include disconnecting (opening) a flange or piece of piping, cutting into a line, or drilling a hole in a pipe for the first time.

Disconnecting instrument, analyzer, and laboratory tubing, hot-bolting, and 4-bolting are not considered First Line Breaks.

The following minimum requirements apply to First Line Breaks:

3.8.1 Job Safety and Hazard Analysis

a. A separate JSHA shall be issued for all First Line Breaks. Do not include other miscellaneous job tasks on this permit.

i. A separate JSHA for the First Line Break is not required for routine maintenance tasks if both:
   a. The task is performed in accordance with a written Operations or Maintenance Procedure (Not a Job Plan), and
   b. The line has been drained, purged per 3.6 Purging, completely de- energized and field Verified that all the Hazards listed below were removed/mitigated.

b. A Genesis Authorized Representative must perform continuous atmospheric monitoring for LEL and toxics is required during the First Line Break.

c. A fire watch with a fire extinguisher will be required and documented using a JSHA when First Line Breaks have the potential for release of flammable materials or vapors.

3.8.2 Hazard Assessment - when assessing the hazards, at a minimum, determine if any of the following hazards exist:

a. Flammable materials

b. Pyrophoric materials

c. High/low temperatures

d. Toxic materials

e. Corrosive materials

f. Pressure

g. Lines or equipment under inert purge

WARNING:

- **ANY MAINTENANCE OR REPAIR WORK INTRODUCING AIR INTO A SYSTEM HAVING THE POTENTIAL FOR PYROPHORIC MATERIALS (INCLUDING ALL SYSTEMS WITH POTENTIAL FOR H2S) SHALL COMPLY WITH 3.7.3 OF THIS PROCEDURE.**

3.8.3 Safeguards – The following minimum safeguards are required:

a. Identify additional valves and preplan expected actions if isolation fails.

b. Establish communication with the Operations Control Center during the First Line Break.

c. Ensure that the worksite has adequate access and clearance to conduct the work

d. Identify safe means of egress to an emergency assembly area.

e. Consider the need to de-energize electrical heat tracing and cathodic protection, and for bonding (jumper) cables to prevent sparking when piping is separated.

f. Capture residual material in approved containers and properly dispose.

g. Identify required PPE:

i. Minimum required PPE includes Hard hat, FRC, safety glasses, safety-toed footwear, goggles and face-shield.

ii. Identify additional PPE according to potential hazards of First Line Break

1. Additional PPE is required if it cannot be verified that the system is drained, depressurized, and free of toxics.

iii. The appropriate respiratory protection must be identified prior to and worn during the First Line Break if:

1. The requirements for Purging have not been met in accordance with 3.6 of this procedure.
2. The toxic PEL's cannot be verified, and monitored during the line break.

3.8.4 Performing the First Line Break

a. Shut-down and/or remove any potential ignition sources within 35 feet prior to First Line Break.

i. Portable air compressor(s) used in conjunction with the tool for "cold cutting" shall be manned at all times during the First Line Break for

emergency shut-down in the event of a product release.

b. Remove all non-essential personnel from the immediate area and use temporary barricades as appropriate. All personnel within the barricaded area must don the appropriate PPE.

c. No other work shall be performed within 35 feet of an initial line break.

d. Use non-sparking tools during the First Line Break (i.e. cold cutting, intrinsically safe power tools, and brass hand tools only).

e. Confirm that the line is depressurized and properly supported prior to removing all of the bolts.

f. Position yourself upwind or crosswind, and crack the joint away from you

g. Stop work immediately and report the condition to a Supervisor if the task of breaking the joint requires more force than can be exerted by hand or by common hand flange spreading tools.

h. Once the First Line Break is completed and the process equipment is confirmed to be free of potential hazards, the Authorized Representative may then downgrade the PPE as appropriate.

3.8.5 Subsequent Line Breaks

When disconnecting (breaking) or connecting (mating or making-up) flanges, follow Procedures or Job Plans:

a. Subsequent line breaks require a hazard assessment with safeguards similar to that of First Line Breaks above – but may be permitted with other job tasks, if appropriate.

3.8.6 Mating Flanges, Making-Up or Connecting

a. Proper alignment is the essential element of flange joint assembly. Proper alignment results in reduced piping stress, maximum seating surface contact, and improves the effectiveness of all bolt tightening methods.

b. Always follow proper bolt torqueing sequences and specifications according to GEL STD.8501 - Bolt Torqueing and Flange Make-Up.

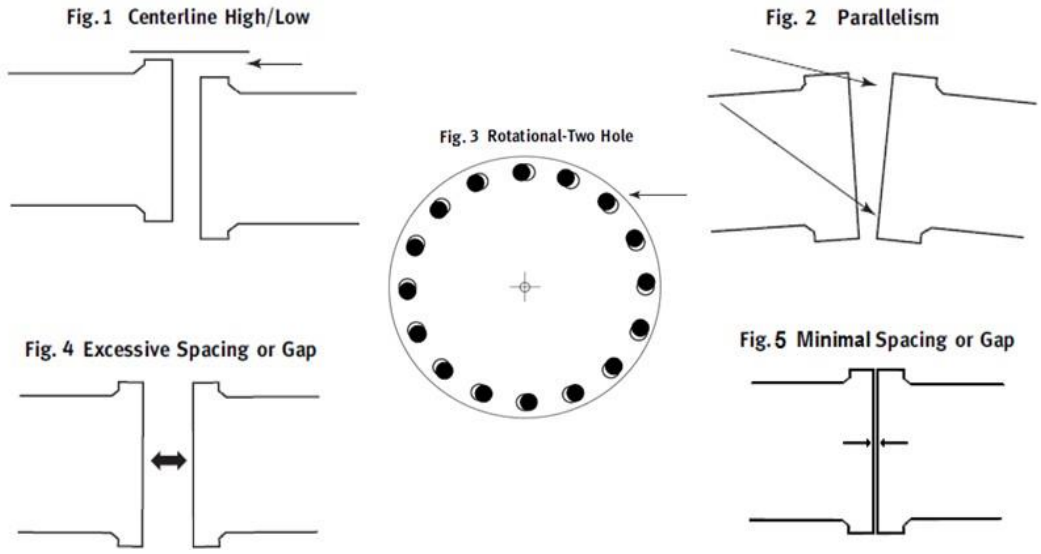
c. Stop immediately and report the condition to a Supervisor if the task or process of aligning piping or equipment requires more force than can be exerted by hand or by common hand alignment tools

i. Upon notification, the Supervisor shall review the alignment concern to determine proper course of action including, but not limited to:
   - CONSULT with Engineering, if necessary, to evaluate alignment

alternatives

- DEVELOP AND SUBMIT for approval a new Scope of Work
- REPAIR misalignment by removal /re-fabrication and/or rerouting piping to ensure proper spacing and alignment

Misalignment examples causing possible stress areas:



3.8.7 Blinds are installed when required by Procedures or Job Plans, or HSSE Procedures, including *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout)* and *GEN_HSSE_03.1P – Confined Space Entry.*

a. Follow the First and Subsequent Line Break requirements when installing Blinds.

b. Plans to install/remove blinds should include a method for de-pressuring through a vent valve on the upstream and downstream piping or the blind itself.

c. Blinds shall be ANSI rated except as allowed by *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout).*

3.9 Hot Bolting Operations

Utilize Hot Bolting Checklist (HB Form 100) for all approved Hot Bolting activities and in accordance with all items below

3.9.1 Obtain Supervisor approval before performing any hot bolting tasks.

3.9.2 Contractors or third party personnel performing hot bolting must have an approved job plan. Contractors will be supervised by Genesis personnel qualified in the performance of this task.

3.9.3 Ensure that all required job safety documentation has been identified, completed and communicated to all affected personnel.

3.9.4 Hammer Wrenches are not allowed while performing hot bolting.

3.9.5 Unless the system or flange joint has been completely depressurized, hot bolting SHALL require JSHA, PPE and hazard mitigation requirements identified in a Job Plan.

3.9.6 No hot work will be allowed on offshore facilities while hot bolting work is in progress. Onshore locations must have 100’ separation between the two activities.

3.9.7 Bolt torque values will be determined by GEL Engineering Standard - STD.8501 – Bolt Torquing & Flange Make-Up.

3.9.8 Ensure the proper grade and type of bolting material is being used for the design of the equipment. Only new studs and nuts will be used for replacement.

3.9.9 Hot bolting will only be allowed on flanges with a minimum of eight bolts.

3.9.10 Operations management and Engineering will perform a risk analysis for each flange / system considering the following criteria at a minimum:

a. Contents of piping or equipment

b. Design and operating pressures and temperatures

c. Possible upset conditions

d. Bending moment on joint (i.e. 8 bolt 150 class B16.5 flange has a high potential for bending)

e. Position and condition of pipe supports

f. Gasket material / thickness / composition (Ring Tool joint, Raised Face, Insulating joint, etc.)

g. Bolt / Nut Condition

h. Through bolted vs. tapped bolts (Tapped bolts not recommended for hot bolting application)

i. Maintenance history / location of the joint

j. Any other unique conditions not listed here

3.9.11 Unless otherwise justified by a risk analysis, hot bolting may only be performed when the operating pressure is equal to or less than 50% of maximum allowable (target) pressure allowed as determined by an engineering review of the following:

a. The pressure-coincident temperature rating for standard flanges.

b. The calculated maximum allowable pressure per the applicable code of construction for nonstandard flanges.

c. The presence of external loads and / or bending moments of the flange and the role they play on the flange pressure carrying capability.

d. The reduction of effective minimum gasket compressive stress between bolts associated with bolt removal (i.e. sufficient loading remains on the gasket to ensure that it maintains a seal).

3.9.12 Emergency isolation valves and/or emergency shutdown stations will be identified before hot bolting begins.

3.9.13 Set up containment and/or barricades as appropriate to protect personnel and the environment.

3.9.14 Once target pressure has been reached for hot bolting to begin, measures shall be put into place to prevent repressurization of the affected system / flange joint. Pressure shall be continuously monitored during hot bolting activities.

3.9.15 Before starting bolt removal, all existing bolts should be checked for tightness and torqued to appropriate values if necessary.

3.9.16 Hot bolting will be performed in a sequence as shown in STD.8501 – Bolt Torquing & Flange Make-Up - Appendix B - Flange Assembly Sequence Record.

3.9.17 Multiple torque tools will not be used simultaneously during hot bolting activities.

3.9.18 Each bolt that is replaced will be torqued to 100% value before removing the next bolt.

3.9.19 Bolts or nuts that cannot be removed with conventional methods can only be removed utilizing cold cutting methods (nut splitter, air saw, hand saw, etc.) if approved by operations management.

3.9.20 Remove debris from each bolt hole and flange gap before installing a replacement bolt.

3.9.21 If a leak is observed during the hot bolting process, stop work and immediately notify the person in charge of the facility.

3.10 Managing Residual Product – Plugs and Air Movers

Plugs and Air Movers are tools used to manage the potential for residual product and prevent hazardous materials from entering the work area. Plugs and Air Movers are not intended to be a substitute or used in lieu of proper Energy Isolation (Lockout/Tagout).

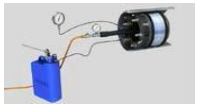
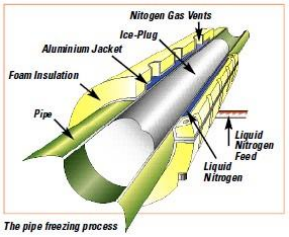
NOTE:

- The utilization of a plug to control hydrocarbon liquid or vapors past an energy isolation (LOTO) point, requires approval.

3.10.1 Pipe Plugs – Types and Approval

a. When performing hot work, the cleaning and purging of piping systems to achieve 0% LEL without relying on air movers is desired over the use of plugs.

b. Where this is attempted and not achieved, the use of piping isolation tools designed for the specific application (e.g. Curtis Wright, CARBER, Furmanite, Smart Plug, Smart Vent or equivalent) is preferred. The type of plug to be used should be determined during the Job Planning process.

Type	Description	Examples	Required Approvals
Isolation Tools	Designed for specific application to safely isolate flammable vapors from hot work	  	Operations VP & HSSE Manager
Mud Plugs	Bentonite (clay) powder mixed with water and formed from balls into ID of pipe (Requires specific procedures below)		
Freeze Plugs	Pipe Freezing involves the use of liquid nitrogen in the controlled formation of a solid ice plug inside the pipeline		
Mechanical Plugs	Mechanical, Plumber's, Foreman, Sewer Plugs, etc.	  	
Inflatable Plugs	Bags, Balloons, Bladders, etc.	 	

c. The General, Venting, and Mud Plug Requirements below apply to all corresponding applications, regardless of whether hot work is performed.

d. A Job Plan or a written procedure approved by the appropriate **Operations Manager and the HSSE Manager / Coordinator** is required for all plug applications.

e. When performing hot work, the use of plugs (all types including isolation tools) as a vapor barrier to hydrocarbon liquid or vapor requires **documented** approval in accordance with the table above, each time prior to use.

3.10.2 General Requirements

Pipe plugs should only be used as a vapor barrier (i.e. secondary isolation device) after the appropriate draining, depressurization, and energy isolation (LOTO) steps are completed.

a. The type of plug, plug placement, line size, vent size, and vent location shall be described in the Job Plan.

b. Caution shall be observed when using plugs as they are only held in place by friction

c. Avoid standing in front of a plug after it is set or when adjustments are being made.

3.10.3 Venting Requirements – Apply to all plug types (Including Mud Plugs)

The pressure behind each plug shall be vented to zero pressure and visually verified. Care shall be taken to ensure a liquid seal in the pipeline does not exist between the plug and the vent that would impede proper ventilation.

a. This vent behind a plug is never to be connected to a flare due to the potential of the flame on the flare propagating through the ignitable atmosphere within the piping.

b. The vent behind a plug shall be large enough to prevent any pressure buildup and to not cause a restriction.

c. Any temporary piping, tubing or hoses attached to the vent(s) behind the plug shall be the same diameter or larger so as to not cause a restriction.

d. Vents should be no less than 2 inches in diameter, unless otherwise determined in the Job Plan and approved by Operations and HSSE.

e. Consider the actual hole (internal diameter of the opening) in the pipe where the vent is located.

f. If a temporary vent line is used, a pressure gauge (0-10 psig or in inches of water) is required upstream of the vent line to monitor and ensure there is no vent line restriction or system pressure buildup.

g. The vent(s) shall be verified free and clear (i.e. nothing plugging or obstructing the vent), and be located a safe distance away from

personnel working. The vent shall be at least 35 feet downwind from the work area.

h. If an air mover or venturi is utilized the plug shall be tethered and a vent through the plug shall be opened.

i. Check for LEL around the plug's sealing surface once it is installed to ensure it is set properly, if accessible.

j. The vent shall be periodically checked at least every 15 minutes by a Genesis Energy operations employee.

   i. Monitor the vent continuously when workers are positioned near the plug.
   ii. Stop work if any pressure buildup is detected, and secure the area until additional safeguards are implemented.

k. LEL % at the vent shall be recorded on the permit initially and again at least every hour by a Genesis Energy Operations employee.

   i. An increase in LEL detected at the vent could be an early indication that pressure may increase.
   ii. Stop work if any pressure or LEL buildup is detected, and secure the area until additional safeguards are implemented.

l. LEL % in the work area shall be continuously monitored immediately before and during hot work.

WARNING:

- **IF ANY LEL IS OBSERVED IN THE WORK AREA, STOP WORK, SHUT-DOWN EQUIPMENT, AND RE-VERIFY ENERGY ISOLATION. EVACUATE THE WORK AREA DOWN RANGE OF THE PLUG AND NOTIFY SUPERVISION.**

m. Before removing or repositioning a mechanical plug, verify that no pressure build up exists behind the plug by opening the vent cap on the mechanical plug.

NOTE:

- In addition to the plug use guidelines in this procedure, manufacturer operating and maintenance instructions must be followed for any type of plug used.

3.10.4 Additional Requirements for Mud Plugs

When using Mud Plugs for vapor seals, a specific written procedure or Job Plan shall be followed that includes these minimum requirements.

a. Use Powdered bentonite (several commercial names are available). Manufacturer's recommendations shall be followed; the typical mixing ratio with water is 50/50 by weight.

b. Mud Plugs cannot be used as the sole vapor seal when:

i. Lines are less than 6"
ii. Piping cannot be vented
iii. Vertical piping or pipe angle greater than 30 degrees

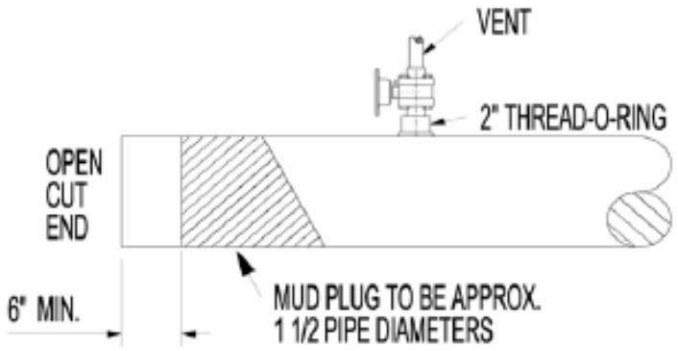
c. Venting shall be provided as detailed above.

d. If an air-mover is used in conjunction with a mud plug, additional vents in the pipe shall be provided to prevent any vacuum from moving the mud plug.

e. Dry Ice may be placed behind the mud plug to create an inert atmosphere "slug" as another protective layer.

f. The length of a completed mud plug shall be 1 ½ pipe diameters (12" pipe = 18" mud plug), except for larger diameter piping where this depth would be beyond access.

Diagram of Typical Mud Plug



3.10.5 Air Movers

Air movers may be used to control residual vapors in piping and equipment and should only be operated by qualified employees or third party personnel.

a. Air movers are NOT considered an "Energy Isolation Device" per *GEN_HSSE_03.6P – Energy Isolation (Lockout/Tagout).*

b. The use of air movers shall require a written job plan or procedure approved by Operations and HSSE.

c. All ventilation equipment will comply with area classification ratings.

d. The air supply for the forced air ventilation will be from a clean source and may not increase the hazards in the space or surrounding area.

e. The air mover is a portable lightweight device for securing a positive forced movement of air or gas, either into or out of a closed area. It requires compressed air to operate and has no moving parts. The device converts the pressure of a compressed air by expansion at a high velocity through an annular orifice, and produces a powerful venturi or jet effect. This causes a large volume of the gas in the pipeline to be drawn through the bell of the air mover, and be delivered with the expanded air supply through the outlet horn.

f. Air Movers shall be grounded with a bolt through type bond to prevent any static sparking. Ground clamps are not allowed.

g. A continuous supply of air must be maintained in order to effect a constant and unfailing up draft at each blow-off once it has been set. Follow the manufacturers operating guidelines for the equipment being used.

h. If test holes are to be cut into pipe, they will be done with COLD cutting tools under First Line Break guidelines in 3.8 of this procedure.

i. All other means including closing additional valves with vents in-between, installing additional blinds, air gapping, plugs, etc., shall be considered prior to the use of air movers to control the residual hydrocarbon vapors in piping.

j. Where air movers are used in conjunction with or after the use of a portable flare, the flare igniter shall be de-energized or disconnected to prevent the risk of ignition of a gas/air mixture that could propagate down the flare and vent piping into the line segment or equipment.

k. Air movers may be used in conjunction with plugs if adequate venting is provided and if negative pressure is never applied to the plug.

l. Before performing any Maintenance or Repair activities, ensure that the requirements of Section 3.13 Transfer to Maintenance and Repair activities are met.

NOTE:

- The utilization of a plug to control hydrocarbon liquid or vapors past an energy isolation (LOTO) point, requires approval.

3.11 Tank Clearing for Entry

This section applies to stationary atmospheric and low-pressure (up to and including 15 psig) above ground petroleum storage tanks.

3.11.1 All sections of this procedure apply to Tank Clearing.

3.11.2 Specific written Tank Clearing Procedures or Job Plans shall comply with all applicable Genesis Energy HSSE Procedures, and API Recommended Practice 2016 "*Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.*"

a. Job Plans or Procedures shall clearly identify the vapor and gas freeing, degassing and ventilation methods.

3.11.3 The API 2016 Sec. 10 Procedure provides basic information to develop a specific tank clearing checklist that may be used to develop plans for safe tank clearing operations.

NOTE:

- This tank clearing checklist is not intended to cover every aspect of every tank clearing operation because of the number of variables affecting each facility and each individual tank.

This checklist includes the following:

a. Applicable government regulations

b. Employer (owner/operator and contractor) policies, procedures and programs

c. Tank design, condition, location and products stored

d. Environmental concerns and requirements

e. Internal and external operations impacting on the tank clearing

f. Rescue requirements

g. Reason for clearing the tank

3.11.4 All Thermal Oxidizer / Vapor Combustor Unit (VCU) operations shall be performed in compliance with API 2016 Sec. 5.

3.11.5 Tank entry shall not be permitted when Thermal Oxidizer / VCU is connected to the tank, operating or not.

3.11.6 Vapor hose line clearing – All vapor hoses shall be disconnected from the vapor source and have a negative pressure pulled to purge the residual hydrocarbons and toxics for a minimum of 5 minutes.

3.11.7 The vapor source, hoses, portable thermal oxidizer, and all other equipment with the potential of producing static discharge shall be grounded and bonded and verified with a continuity meter prior to starting the degassing process.

3.12 Verification Testing

Verification testing will be performed to determine potential hazards prior to releasing equipment and/or systems for maintenance and repair.

3.12.1 Verification Testing for LEL and Toxics shall be performed.

a. If the testing results indicate that contaminants remain, additional purging or other strategies shall be needed to make the equipment and system safe for work.

b. If it is determined that isolation points are not holding, other strategies shall be documented in a Job Plan, and approved by the Operations Supervision and HSSE Manager / Coordinator.

3.12.2 Pyrophoric Materials

Remove pyrophoric materials before maintenance or repairs are performed.

a. If there are any indications of residual pyrophoric contaminants, repeat the cleaning steps found in 3.7.3 of this procedure. It may be necessary to consult with engineering to develop alternative strategies specific to the contaminant.

b. If at any time indications such as smoldering or smoking are observed, immediate actions shall be taken to prevent combustion of the material (e.g. remove the oxygen source, etc.).

3.12.3 Confined Space – If the equipment or system is to be entered, the space shall comply with the requirements of *GEN_HSSE_03.1P – Confined Space Entry.*

3.12.4 For floating roof tanks – the Verification Testing shall include roof legs and pontoons.

3.13 Transfer to Maintenance and Repair Activities

Once the flammable gas, liquids, corrosive or toxic materials have been removed in accordance with this procedure, the system or equipment can be turned over to maintenance for the planned repairs or maintenance activities.

3.13.1 Permitting shall be in accordance with *HSSE_03.13P-Job Safety and Hazard Analysis.*

3.13.2 Any Confined Space Entry shall be in accordance with *GEN_HSSE_03.1P – Confined Space Entry.*

3.14 Return to Service

Once all maintenance and repair activities have been completed, Job Plans or written Procedures shall be followed when returning the equipment or system to service; including considerations for leak testing, oxygen removal, and the introduction of hydrocarbons.

3.14.1 Completed repair and maintenance work shall be inspected and approved by Genesis Energy.

3.14.2 Prior to the introduction of hydrocarbons into new or modified piping systems, and/or especially following shutdowns or major maintenance activities where equipment was open to atmosphere:

a. Perform a Leak Test. Do not exceed Maximum Allowable Operating Pressure (MAOP).

i. Various leak test methods exist, including bubble test (Snoop solution) and other local Operating Procedures for Leak Testing.

b. Purge with nitrogen, to remove air from the system, down to 0.5% Oxygen or less.

i. Exceptions to Purging with Nitrogen include:
   a. Crude Oil Systems
   b. Natural Gas or Crude Oil Pig Launchers and Receivers
   c. Short Natural Gas meter runs
   d. Natural Gas Compressors
   e. Other exceptions shall be reviewed and approved on a case-by-case basis (no blanket approvals) by Operations and HSSE.

NOTE:

- Refer to Appendix B – Purging Flow Chart for details.

3.14.3 The Pre-Start-up Safety Review (PSSR) and all pre-startup action items shall be completed prior to introducing hydrocarbons in accordance with GEN_HSSE_08.3P – Management of Change (MOC).

3.14.4 . Remove all potential ignition sources and non-essential personnel from the immediate area prior to the introduction of hydrocarbons.

3.14.5 Follow all applicable local startup procedures.

3.14.6 Check for leaks upon introduction of hydrocarbons, at 100 to 200 psig increments, up to normal operating pressure and during start-up.

3.14.7 Continue checking for leaks after the system reaches steady-state and normal operating temperatures; until it is determined there are no leaks.

4.0 References & Revisions

4.1 Genesis Energy HSSE Procedures Manual

4.1.1 03.1P – Confined Space Entry

4.1.2 03.6P – Energy Isolation (Lockout/Tagout)

4.1.3 03.13P – Job Safety and Hazard Analysis

4.1.4 03.14P – Job Plan

4.1.5 04.2P – Personal Protective Equipment (PPE)

4.1.6 08.3P – Management of Change (MOC)

4.2 Genesis Energy Engineering Standards

4.2.1 STD.8012 Welding Hot Taps

4.2.2 STD.8501 Bolt Torqueing and Flange Make-Up

4.3 API RP 2016

4.3.1 Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks

4.4 Form(s)

4.4.1 Hot Bolting Checklist (HB-100)

4.4.2 Vacuum Truck Checklist (VT-100)

4.5 Revisions

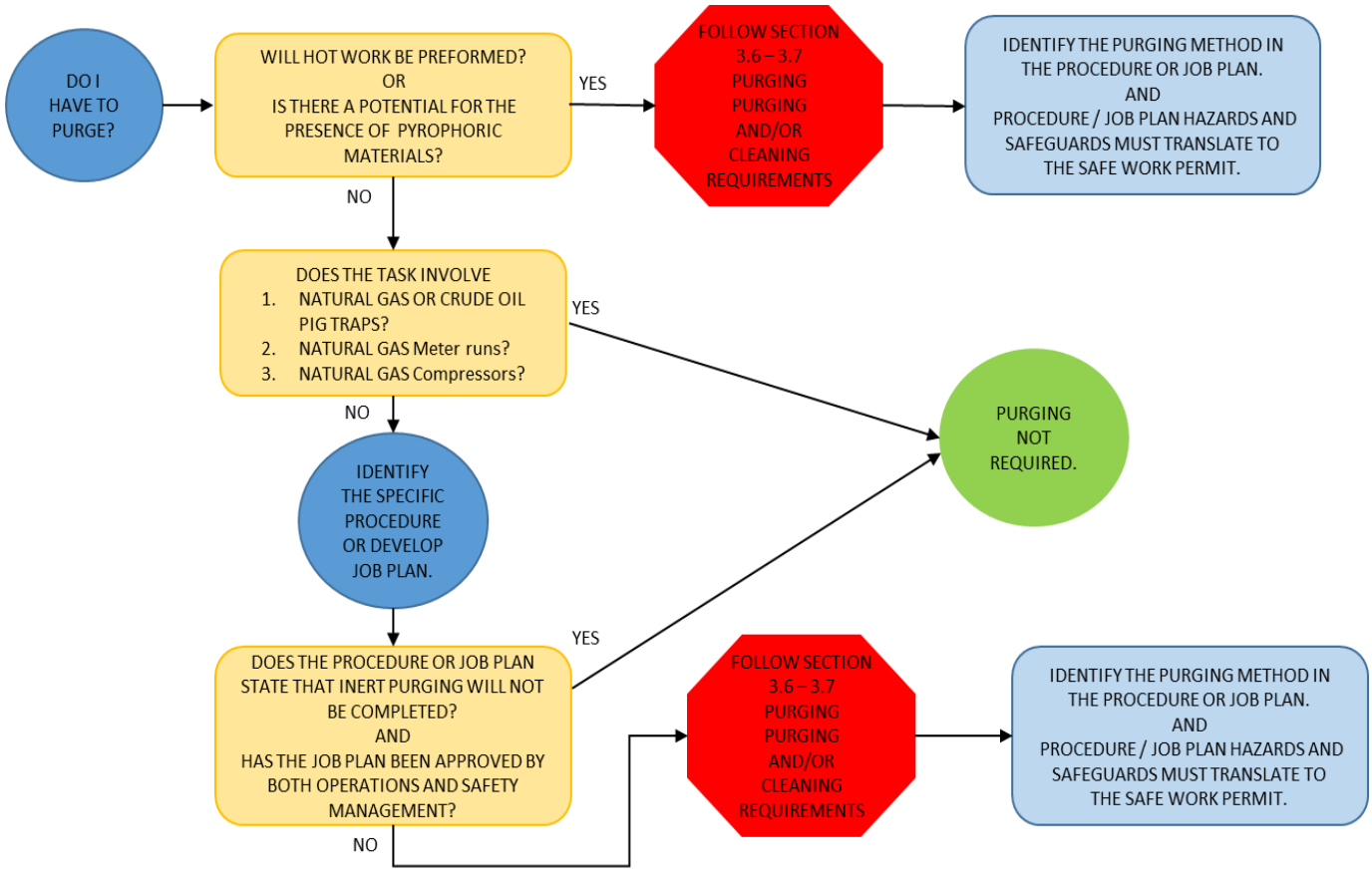
Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
06/09/2021	3.5.7	Addition of VT-100 – Vacuum Truck Checklist
05/10/2023	Throughout	Update Safe Work Permit references to JSHA

Appendix A. Nitrogen (Inert Gas) Slug and Purge Requirements

Nitrogen (Inert gas) Slug and Purge Requirements

Pipe Length in Feet			500		1000		2000		5000		10000		20000		50000		100000	
Pipe Size (in)	Minimum Stratification Velocity (ft/sec)	Flow rate (ft^3/min)	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow	Slug Volume (ft^3)	Minutes of Nitrogen Flow
4	2	7.93	19	2.40	23	2.90	29	3.66	40	5.04	53	6.68	71	8.95	107	13.49	130	16.44
6	2.1	25.34	46	1.82	56	2.21	70	2.76	98	3.87	129	5.09	173	6.83	261	10.30	319	12.58
8	2.4	50.17	77	1.53	94	1.87	117	2.33	164	3.27	217	4.33	291	5.80	439	8.75	537	10.70
10	2.8	92.23	121	1.31	147	1.59	184	2.00	257	2.79	340	3.69	457	4.96	688	7.46	842	9.13
12	3	141.39	173	1.22	211	1.49	263	1.86	368	2.60	486	3.44	653	4.62	985	6.97	1,204	8.51
14	3.2	183.82	243	1.32	298	1.62	373	2.03	524	2.85	694	3.77	934	5.08	1,412	7.68	1,728	9.40
16	3.5	266.06	324	1.22	399	1.50	500	1.88	705	2.65	935	3.51	1,260	4.74	1,908	7.17	2,336	8.78
18	3.6	350.85	417	1.19	515	1.47	648	1.85	916	2.61	1,217	3.47	1,642	4.68	2,489	7.09	3,048	8.69
20	3.8	460.76	524	1.14	649	1.41	817	1.77	1,158	2.51	1,540	3.34	2,080	4.51	3,157	6.85	3,868	8.39
22	4.1	620.52	644	1.04	799	1.29	1,007	1.62	1,431	2.31	1,906	3.07	2,577	4.15	3,915	6.31	4,797	7.73
24	4.2	743.45	777	1.05	966	1.30	1,220	1.64	1,737	2.34	2,316	3.11	3,133	4.21	4,764	6.41	5,840	7.86
26	4.4	918.00	924	1.01	1,151	1.25	1,456	1.59	2,076	2.26	2,770	3.02	3,751	4.09	5,708	6.22	6,999	7.62
28	4.6	1117.14	1,085	0.97	1,353	1.21	1,715	1.53	2,449	2.19	3,270	2.93	4,431	3.97	6,748	6.04	8,276	7.41
30	4.8	1344.64	1,260	0.94	1,574	1.17	1,997	1.48	2,855	2.12	3,817	2.84	5,175	3.85	7,886	5.86	9,673	7.19
32	4.9	1565.94	1,449	0.93	1,813	1.16	2,303	1.47	3,297	2.11	4,410	2.82	5,984	3.82	9,123	5.83	11,194	7.15
34	5	1808.12	1,653	0.91	2,070	1.15	2,633	1.46	3,774	2.09	5,052	2.79	6,858	3.79	10,462	5.79	12,839	7.10
36	5.2	2115.45	1,871	0.88	2,347	1.11	2,987	1.41	4,287	2.03	5,743	2.71	7,800	3.69	11,904	5.63	14,611	6.91
38	5.4	2452.34	2,104	0.86	2,642	1.08	3,366	1.37	4,837	1.97	6,483	2.64	8,809	3.59	13,451	5.48	16,513	6.73
40	5.6	2823.59	2,353	0.83	2,957	1.05	3,771	1.34	5,423	1.92	7,273	2.58	9,888	3.50	15,104	5.35	18,545	6.57
42	5.8	3230.06	2,616	0.81	3,291	1.02	4,201	1.30	6,047	1.87	8,114	2.51	11,036	3.42	16,865	5.22	20,709	6.41
44	5.9	3612.10	2,894	0.80	3,645	1.01	4,656	1.29	6,709	1.86	9,007	2.49	12,254	3.39	18,734	5.19	23,008	6.37
46	6	4020.90	3,188	0.79	4,019	1.00	5,137	1.28	7,409	1.84	9,951	2.47	13,545	3.37	20,714	5.15	25,444	6.33
48	6.1	4457.26	3,497	0.78	4,413	0.99	5,645	1.27	8,147	1.83	10,948	2.46	14,907	3.34	22,806	5.12	28,016	6.29
50	6.1	4858.07	3,823	0.79	4,827	0.99	6,179	1.27	8,925	1.84	11,999	2.47	16,343	3.36	25,011	5.15	30,728	6.33
52	6.2	5362.20	4,163	0.78	5,261	0.98	6,740	1.26	9,742	1.82	13,103	2.44	17,853	3.33	27,330	5.10	33,581	6.26
54	6.4	5896.37	4,520	0.77	5,716	0.97	7,328	1.24	10,599	1.80	14,261	2.42	19,437	3.30	29,764	5.05	36,576	6.20
56	6.5	6461.15	4,893	0.76	6,192	0.96	7,943	1.23	11,497	1.78	15,475	2.40	21,097	3.27	32,315	5.00	39,715	6.15
58	6.6	7057.09	5,282	0.75	6,689	0.95	8,585	1.22	12,434	1.76	16,743	2.37	22,833	3.24	34,984	4.96	42,998	6.09
60	6.7	7684.73	5,687	0.74	7,207	0.94	9,255	1.20	13,413	1.75	18,068	2.35	24,646	3.21	37,771	4.92	46,428	6.04

Appendix B. Purging Flow Chart



03.13P-Job Safety and Hazard Analysis

1.0 Scope

The Job Safety and Hazard Analysis (JSHA) procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors.

2.0 Purpose

The purpose of this procedure is to ensure pre-work planning and appropriate communications are completed prior to work beginning and ensure compliance with applicable federal, state and local requirements.

3.0 Procedure

NOTE:
This procedure is a combination of archived procedure 03.8P-Safe Work Permit (SWP) and 03.13P-Job Safety Analysis (JSA). The SWP and JSA forms have been combined in the JSHA Permit. Refer to this procedure for any references found for SWP or JSA in any HSSE or operating procedures.

3.1 Definitions

3.1.1 **Hazard** - a condition or action that has the potential for unplanned release of, or unwanted contact with, any source of potential damage, harm or adverse health effects to people, property, or the environment.

3.1.2 **Hazard Mitigation** - the act of reducing or eliminating hazards through the use of controls to an acceptable risk level.

3.1.3 **Hot Work** – work involving electric or gas welding, cutting, brazing, grinding or similar flame or spark producing operations. During hot work activities, use 3.13F-HW-100-Hot Work Checklist.

3.1.4 **Job Safety and Hazard Analysis** - a process used to identify health, safety and/or environmental hazards associated with performing a specific job or task and the actions to be taken in order to eliminate or minimize those hazards.

3.2 Tasks Requiring a JSHA

3.2.1 A JSHA may be conducted for any job where the process will prevent accidents or injuries. A JSHA will be required for, but not limited to the following:

a. Confined space entry
b. Crane or lifting operations
c. Hot work
d. Infrequently performed jobs
e. Lockout/Tagout
f. Non-Intrinsically safe tools/equipment in classified areas
g. Open holes
h. Opening of process piping or equipment
i. Simultaneous operations (SIMOPS)
j. Vessel/tank cleaning
k. Working at heights or outside handrails
l. When deemed necessary by management

3.2.2 Templated or pre-filled JSHA-100s are authorized to be used and shall be updated to include actual site specific conditions. These updates can be handwritten or typed.

3.3 JSHA Process

3.3.1 The JSHA process begins with a review of the worksite where the planned work activity will take place to visually inspect for hazards. It is crucial that all personnel involved in a job task be included in the process so all potential hazards will be identified and eliminated or reduced to an acceptable level.

3.3.2 Document initial hazard analysis on JSHA-100 including:

a. General information

b. Potential hazards

c. Initial atmospheric monitoring – Refer to HSSE_04.1P-Atmospheric Monitoring.

d. Hot work

e. Intrinsic safety

f. Additional required documentation

g. Personal protective equipment

3.3.3 List each step of the job in order of the occurrence. It is recommended to begin each step with an action word such as "remove", "conduct", "perform", "weld", "open", and "isolate".

NOTE:
Contractor JSA may be utilized in lieu of Section 9-Job Analysis as long as the contractor JSA meets the requirements of this procedure.

3.3.4 Using Appendix A – Hazard Identification, HSSE Procedures, industry best practices, industry regulations and experience to identify hazards associated with each step.

3.3.5 List every action necessary to eliminate or minimize every potential safety, health and environmental hazard through the use of controls.

3.3.6 Assign a person to be accountable for the hazard mitigation or control method. Ensure the person accountable for the hazard mitigation or control method has initialed or signed the JSHA-100 as an acknowledgement of their responsibility.

3.3.7 Review the steps with each person involved in the task to ensure the job task has been covered in its entirety.

3.3.8 All employees involved in the job will sign in on the communication and accountability section, including time in and out.

3.3.9 The authorized representative, contract/department representative and/or Person in Charge/Ultimate Work Authority, will review the hazards and mitigations as well as the accuracy and completeness prior to authorizing the approval to work.

3.3.10 Upon completion of the job, the authorized representative, contract/department representative and/or person in charge/ultimate work authority, will conduct a post jobsite visit to ensure the following:

a. Scope of work is completed.

b. Affected parties are notified of work completed.

c. Worksite is cleaned and secured.

d. If applicable, system and equipment are inspected and returned to normal operating condition.

Once all the above are verified, the authorized representative, contract/department representative and/or person in charge/ultimate work authority will authorize the closure of the JSHA-100.

3.4 JSHA Guidelines

3.4.1 JSHA-100 may be issued for a period up to one work shift not to exceed 16 hours.

3.4.2 Electronic JSHA-100 will be numbered with the following: date-department-consecutive numbering. Example 01/01/21-Ops-001, 01/01/21-Ops-002, etc. Department initials are as follows:

a. Operations – Ops

b. Maintenance – Maint

c. Measurement – Meas

d. I&E - IE

3.4.3 Through the duration of the task, the authorized representative will maintain the JSHA-100 in an accessible location.

3.4.4 Each JSHA-100 will be retained for a period of two years. Offshore must retain JSHA-100s a minimum of 30 days onsite.

3.4.5 If any element of the job changes, STOP THE WORK IMMEDIATELY, regroup, and revise (handwritten or typed) the JSHA-100; then get approval from the Facility/Area Manager/Person in Charge (PIC) to return to work.

4.0 References and Revisions

4.1 References

4.1.1 None.

4.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
09/01/2017	N/A	Initial Release
12/07/2022	All	Combination of 03.8P-Safe Work Permit and 03.13P-Job Safety Analysis
09/25/2023	3.1.2	Add definition of Hot Work and update definition of Mitigation to Hazard Mitigation

Appendix A: Hazard Identification Tool

Hazard Identification Tool

(Reference the following to identify Potential Safety, Health, and Environmental Hazards)

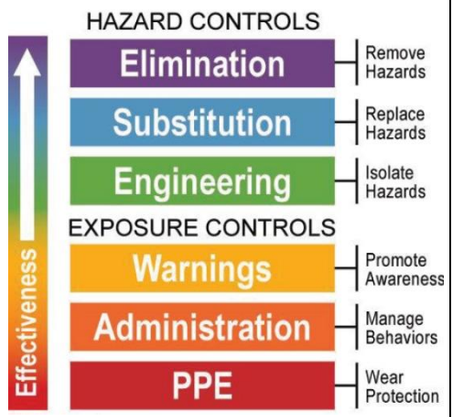
Procedures
- Are all permits/checklists completed for this job/task?
- Are there procedures for this job/task and are they being used?
- Is there an incident history for similar jobs/tasks?
- Are simultanious operations occuring?

Equipment and Tools
- Will energy isolation (LOTO) procedures be required?
- Is process piping being opened?
- Is lifting/rigging being done?
- Are the correct tools available for this job/task?
- Are hand tools or power tools being used?
- Have tools and equipment been inspected and are in good working condition?
- Are vehicles/heavy equipment involved?
- Is mechanical and/or rotating equipment involved?

Personal Protective Equipment
- Can a greater hazard control be applied?
- Is all PPE available and in good condition?

Positions of People
- What could we be struck by?
- What could we strike ourselves against?
- What can we get caught in/on/between?
- Is there a risk of dropped or falling objects?
- Where and what are the potential slip/trip/fall hazards?
- What is the condition of walking/working surfaces?
- Where and what are the potential hand/finger pinch points?
- What electrical current could we come in contact with?
- Is this a high traffic area?
- What would cause us to overexert ourselves?
- Are we working from height or over water?

Environmental Concerns
- What are the environmental/location hazards?
- Are there risks of inhaling/absorbing/ingesting hazardous substances or chemical irritants?
- Are there combustible/flammable/ignition sources?
- What are the weather conditions (hot/cold/rain)?
- Is lighting adequate?
- Is sound at a level that would require additional PPE?
- Are systems or containers under pressure involved?
- Are biological hazards present?
- Is there potential for radiation exposure?
- Will an open hole or excavation be present?
- Is there a risk for potential leaks/spills that could pose a threat to our health and safety as well as the environment?



Hazard Sources	Hazardous Conditions	Physical Hazards	Hazard Sources	Hazardous Conditions	Physical Hazards
Biological – Living organisims that can present a hazard.	Animals, bacteria, viruses, insects, blood-borne pathogens, improperly handled food, contaminated water, mold exposure.	Bites / stings, infection, disease, poison, illness	**Motion** – The change in position of objects or substances.	Vehicles, vessel or equipment, flowing water, wind, body positioning, gear movements, vibration, human interfaces.	Slip, trip, fall, pinch / crush point, caught between, struck by object, laceration, sprain, hand / finger injury
Chemicals – chemicals that have the potential to create a physical or health hazard to people, equipment, or the environment.	Flammable, combustibles, reactive hazards, toxic compounds, corrosives, inert gas, welding fumes, H2S, brine, drilling & production fluids.	Fire / explosion, eye injury, inhalation, ingestion, absorption, asphyxiation, burns, poisoning, pyrophoric material	**Pressure** – Energy applied by a liquid or gas which has been compressed or is under a vacuum.	Pressure piping, compressed gas cylinders, control lines, vessels, tanks, hoses, pneumatic and hydraulic equipment, pipelines.	Trapped pressure, pressure release, injection, flying debris, leak or spill, equipment overpressure, fire / explosion, asphyxiation
Electrical – The presence and flow of an electric charge.	Power lines, transformers, static charge, lightning, energized equipment, wiring, batteries, sparks, frayed or damaged cords / wires / cables, poor electrical grounding.	Electric shock, arc flash burns, ignition source, fire, explosion	**Radiation** – The energy emitted from radioactive elements and naturally occuring radioactive materials.	Lighting issues, welding, arc, X-rays. Solar waves, (NORM) scale, microwaves, lasers, non-ionizing sources, electromagnetic radiation and related equipment	Radiation exposure / sickness, eye injury (welding arc)
Gravity – The force caused by the attraction of all other massses to the mass of the earth.	A dropped object, a collapsing roof/floor, a body tripping or falling, lifting operations, crash injuries.	Falling objects, struck by object, drowning (working over water), suspension trauma, equipment overload, open hole, pinch / crush point, hand / finger injury, foot / toe injury	**Sound** – When a force causes an object or substance to vibrate.	Compressors, drilling, impact tools / equipment, high pressure relief, loose parts, air tools, the environment, natural gas or diesel driven engines.	Hearing damage, harmonic vibrations, equipment damage / failure
Mechanical – The energy of the components of a mechanical system, i.e. rotation, vibration, motion, etc.	Rotating equipment, compressed springs, drive belts, conveyors, motors, articulating equipment, fans, pulleys, striking / pounding.	Pinch / crush points, lacerations, fire / explosion, flying debris / particles, hot surfaces, burns, sharp objects, tool kick back, hand / finger injury	**Temperature** – The measurement of differences in the thermal energy of objects or the environment.	Open flame and ignition sources, liquids or gases, hot work, friction, environmental conditions, steam, extreme and changing weather conditions.	Frostbite, burns, hypothermia, heat illness / stroke, dehydration, ignition source

03.14P-Job Plan

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) operating areas. Maintaining and coordinating the Job Planning process shall be the responsibility of the Genesis Energy work group responsible for the Scope of Work.

2.0 Purpose

- The purpose of this procedure is to establish guidelines on when a job plan is required and the components of the job plan process.

3.0 Procedure

3.1 Definitions:

3.1.1 Field Execution Meeting – Onsite meeting between Authorized Representative, Genesis employees and contractors prior to commencement of work or at shift change.

3.1.2 Job Description/Schedule - Job Task(s) to be performed and the estimated start and completion dates.

3.1.3 Job Plan Revision # - Draft A, B, C etc. will be used until approval. Initial issue of approved Job Plan always begins with Revision 0. Plan Modifications thereafter will be Revision 1, 2 etc. as needed.

3.1.4 Pre-Job Meeting - Stakeholder meeting to review overall scope and objective from beginning to end of project and finalize Job Plan approval.

3.1.5 Scope of Work/Objective - A precisely worded document describing what work is to be performed.

3.1.6 Stakeholder - Those people responsible and involved in developing the Job Plan and executing the requirements within the Job Plan. Stakeholders may also include those affected by the work associated with the Job Plan (i.e. Pipeline Control, Commercial, etc).

3.2 Tasks Requiring a Job Plan

The Job Planning Process is a valuable communications tool through which all parties involved in work activities shall review the scope, objectives, resources, safety, health, environmental and training considerations prior to beginning work.

3.2.1 A Job Plan (HSSE_03.14F-JP-100) is required for work that does not have an established written procedure and any of the following:

- Higher risk work activities
- Opening process piping

- Performing work on exposed energized electrical equipment
- Commissioning equipment
- Complex energy isolations
- Tasks involving unique safety hazards
- Unusual resource needs
- Work extending over multiple shifts
- Tasks requiring multiple disciplines (i.e. construction, operations, maintenance, etc.)
- When deemed necessary by Management

3.3 Tasks Not Requiring a Job Plan

3.3.1 A Job Plan is not required when an established written procedure is in place.

3.3.2 A Job Plan is not required for Emergency Response. Emergency Response activities will be performed in accordance with Emergency Response Plans (ERPs).

3.3.3 Troubleshooting - Work performed by qualified persons related to tasks such as testing, voltage measuring, etc., shall be permitted to be performed without the issuance and approval of a Job Plan, following established safe work practices.

3.3.4 When all stakeholders agree that a JSHA are sufficient for the task and a Job Plan is not necessary.

3.4 Job Plan Requirements

3.4.1 Engineering, Operations and HSSE will determine how and when the Job Planning Process will be implemented for projects.

3.4.2 The level of detail shall be specific to the Scope of Work in a Job Plan and shall be equivalent to a written procedure.

a. Job Plan shall contain the steps required to safely and efficiently complete the tasks involved.

b. Job Plan shall include the steps required to correct or avoid deviations which could reasonably result in personnel injury or equipment damage.

c. Individual completion steps are identified so the Job Plan is organized into a series of easily understandable actions.

d. Unique, complex, or specialized steps shall be detailed to ensure all stakeholders understand the task. This may include schematics, pictures, procedures and/or appendices as required.

3.4.3 The work group(s) responsible for planning the work must:

a. Ensure the Job Plan is prepared and distributed to the stakeholders two business days (when possible) in advance for review and approval.

b. Contractor(s) Operator Qualifications shall be verified by work group generating Job Plan during the Job Planning Process.

c. Contractor(s) Master Service Agreement, insurance, and training should all be verified for compliance during the Job Planning Process.

3.5 Pre-Job Meetings

3.5.1 Pre-Job meetings (face-to-face or teleconference) will be conducted to review the overall scope and objective from start to completion of the project. Pre-Job Meetings will be conducted prior to any work activities beginning and must include the following:

a. Approval must be completed by Facility/Area Manager and Regional HSSE Manager/Coordinator. An approval by electronic signature (e-mail approval maintained by Job Plan Originator) or hard signature on Job Plan is acceptable.

b. Job Plan Originator will distribute approved Job Plan to Stakeholders.

c. All Stakeholders are responsible for ensuring the approved Job Plan is communicated to employees participating in the work.

3.5.2 Operations and HSSE will evaluate the completed Job Plan and anticipated frequency of work to determine if procedures need to be developed.

3.6 Field Execution Meeting

3.6.1 Review the current approved Job Plan with on-site personnel prior to starting the work.

3.6.2 Review the potential hazards associated with the work and the applicable safety, health, environmental, and emergency response procedures.

3.6.3 Review task specific Abnormal Operating Conditions (AOCs) prior to starting the work. Task specific AOCs can be found in the Operator Qualification Program- Appendix J- AOC Recognition and Response.

3.6.4 Record the meeting date and the names of the meeting attendees.

3.6.5 Prior to work commencing, the Genesis Representative/Designee will verify Operator Qualifications in ISNetworld for individuals performing Covered Tasks.

3.7 Plan Modification

3.7.1 Modify an approved Job Plan when one or more of the following occur:

a. Deviations in the approved Scope of Work

b. Deviations in the approved Detailed Procedure section of the Job Plan

c. Unexpected hazards are encountered

3.7.2 If a near miss, incident or other circumstances arise during the Scope of Work, review the Job Plan to determine if changes are necessary.

3.7.3 Job Plan modifications must complete the approval process as described in 3.2.6.

3.8 Supporting Documentation

Supporting documentation required for the job plan review meeting will include but not be limited to:

3.8.1 JSHAs for the entire scope of work.

3.8.2 P&ID or electrical drawing markups identifying the LOTO scheme, pipe / component replacements or repairs, identification of vent and purge points on equipment and any other job safety communication information as applicable.

3.8.3 LOTO / Blind list with isolation points that coincide with P&ID or electrical drawing markups as applicable.

3.8.4 Any other form, checklist or job safety communication tool required by the HSSE Procedures Manual or Offshore Safety Policies Manual for the scope of work being performed.

4.0 References and Revisions

4.1 References

4.1.1 Operator Qualification Program - Appendix J-AOC Recognition and Response.

4.1.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
09/01/2017	N/A	Initial Release
06/21/2021	1.0 2.0 3.1.5 3.2.1 3.3 3.4(d) 3.4.3 3.5(d) 3.6.3 3.6.5 Appendix A	Remove list of operating areas; this procedure applies to all GEL operating areas. Move Job Planning Process description to Section 3.2 Remove Pre-Job Safety Assessment definition New Section – Tasks Requiring a Job Plan New Section – Tasks Not Requiring a Job Plan New: Unique, complex, or specialized steps shall be detailed to ensure all stakeholders understand the task. This may include schematics, pictures, procedures and/or appendices as required. Add OQ, MSA, Insurance and training verification during Job Planning Process Removed Job Plan Revision Management, already covered in definitions New: Review task specific Abnormal Operating Conditions (AOCs) prior to starting the work. Task specific AOCs can be found in the Operator Qualification Program- Appendix J- AOC Recognition and Response. New: Prior to work commencing, the Genesis Representative/Designee will verify Operator Qualifications in ISNetworld for individuals performing Covered Tasks. Removed
05/10/2023	Throughout	Update JSA to JSHA and remove Safe Work Permit throughout.

04.2P-Personal Protective Equipment (PPE)

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors at GEL owned or operated facilities.

This document does not address personal protective equipment (PPE) for emergency response activities. Emergency response PPE requirements are addressed in facility emergency procedures.

This document does not address respiratory protection. Respiratory protection requirements are addressed in HSSE_06.6P – Respiratory Protection.

2.0 Purpose

The purpose of this procedure is to establish a uniform PPE standard for GEL employees and contractors.

3.0 Procedure

3.1 General PPE Requirements

3.1.1 All necessary PPE shall be provided, at no cost, to the employee.

3.1.2 All PPE (including employee-owned) shall be in conformance with regulatory standards such as OSHA and ANSI.

3.1.3 All PPE (including employee-owned) shall be used and maintained in a sanitary and reliable condition.

3.1.4 Employees are responsible for the proper inspection, use, cleaning and storage of their assigned PPE.

3.1.5 It is the responsibility of the Facility/Area Manager/Person in Charge (PIC) to assure the adequacy, maintenance and sanitation of assigned PPE.

3.1.6 PPE shall be fitted to the affected employee.

3.1.7 Defective or damaged PPE shall not be used. Replacement PPE shall be obtained immediately.

3.1.8 Where there is the potential for exposure to hydrogen sulfide gas (H_2S), employees will be issued and required to properly wear personal H_2S monitors within the breathing zone. Refer to HSSE_06.4P-Hydrogen Sulfide for additional information.

3.1.9 If required, intrinsically safe flashlights (headlamp or handheld) will be provided to employees when conducting work in classified areas.

3.2 Training

3.2.1 Training will be provided to employees addressing:

a. When to wear PPE;

b. What PPE should be worn;

c. How to put on, take off and adjust PPE;

d. The limitations of the PPE; and

e. Its use, care, and maintenance.

3.2.2 When there is reason to suspect the affected employee did not understand the training received or there are changes in the workplace then the employee shall be retrained.

3.2.3 PPE training shall be documented on a safety meeting form or equivalent.

3.3 PPE Hazard Assessment

3.3.1 The Facility/Area Manager/Person in Charge (PIC) in conjunction with Health, Safety, Security and Environmental (HSSE) shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE. If such hazards are present, or likely to be present, the employer shall:

a. Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment and;

b. Communicate selection decisions to each affected employee; and select PPE that properly fits each affected employee

3.3.2 A PPE Hazard Assessment shall be documented in writing utilizing at least one of the following forms:

a. PPE Hazard Assessment Form (HSSE_04.2F - PPE-101)

b. Job Safety and Hazard Analysis (HSSE_03.13F - JSHA-100)

c. Job Plan Form (HSSE_03.14F - JP-100)

The following minimum requirements will be addressed:

a. The work area and task evaluated

b. The person certifying that the evaluation has been performed

c. The date(s) of the hazard assessment

3.3.3 The PPE Hazard Assessment shall be reviewed on a periodic basis and updated as needed or if workplace conditions or hazards change. The PPE Hazard Assessment shall be approved by HSSE.

NOTE:

Minimum PPE requirements for entry into all petroleum / chemical / transportation / pipeline / operational facilities shall be as follows:

- Hard Hat
- Flame Resistant Clothing (FRC)
- Safety Footwear
- Safety Glasses with side shield or Goggles

Except as specifically noted in these PPE standards.

3.4 General Eye and Face Protection

GEL employees, contractors, and visitors shall wear appropriate eye protection in work areas subject to conditions where foreign objects, chemicals, or liquids may enter the eye. These tasks include, but are not limited to the following:

a. Cutting, welding, grinding, drilling
b. Chemical or quality lab work
c. Use of drill press
d. Sanding
e. Loading & unloading of crude oil or other chemicals
f. Connecting or disconnecting hoses or piping
g. Use of compressed air
h. Hammering, chipping, sawing
i. Use of power tools, and
j. Working in high wind conditions.

Lenses and frames with side shields must be **ANSI Z87.1** approved. See Appendix A for eye protection selection guidance.

3.4.2 Goggles

a. Goggles shall be worn when there is increased potential of chemical exposure due to splashing liquids or windblown hazards. Examples of activities where goggles need to be worn:
    1. Handling hazardous liquids
    2. Lab work

3. Windy days with blowing debris
4. Sandblasting or abrasive blasting operations

3.4.3 Face Shields

a. A face shield is required in **addition to safety glasses** when grinding, chipping, weed trimming/edging or other tasks having the potential for flying hazards or debris.

b. A face shield is required in **addition to goggles** when a chemical splashing hazard is possible.

CAUTION:

- **If entry is made into an area where there is a potential for flying particles, dust, oil, chemical, or liquids, then goggles and face shield shall be worn.**

3.4.4 Contact Lenses

a. Contact lenses may be worn in approved facilities and areas; however safety glasses with side shields or wrap around eye protection must be worn while working in the field.

b. Contact lenses shall not be worn when PPE conditions require the use of a full face, supplied air respirator or airline operations.

3.4.5 Prescription Eye Protection

a. One pair of ANSI approved prescription safety glasses with side shields (rigid to fit the glasses) is reimbursable up to $370 when employee's prescription changes or the glasses are damaged beyond repair.

b. See HSSE_04.2P-PPE-100 – Prescription Eyewear Order Form for ordering safety glasses from the approved third party vendor.

c. Over The Glass (OTG) protection that meets ANSI Z87.1 standards may be worn over standard prescription eye glasses.

3.5 Head Protection

3.5.1 The Company provides ANSI Z89.1 (Type 1 or 2 – Class E) hardhats.

3.5.2 Head protection shall be worn at all times while working outside of control rooms and offices, electrical motor control centers and high voltage electrical substations. For all trucking terminals, head protection shall be worn inside shops having falling object hazards

3.5.3 Employees are required to wear head protection when they are inside plant facilities, visiting job or lease sites and field operations, and/or when involved in off-site pipelines, product-handling terminals, pipeline pump and compressor stations, right of ways (ROW), measurement activities, and on platforms.

3.5.4 Inspect your hardhat each day for cracks, brittleness and discoloration.

a. Check the suspension for pliability, breaks and frayed straps.

b. If you detect any sign of wear or damage, replace the suspension and/or shell immediately.

c. Mark in-service date on the inside of the shell when placing new hardhat into service or when changing suspension system. Replace as follows:

i. Suspension System – Replace if loose, cracked, worn, or does not provide proper support. Replace no later than 12 months after being placed into service.

ii. Shell – Replace if it has physical gouges or cracking, has become brittle, or has been exposed to chemical, sunlight, or age that weakens the shell. Always replace the hard hat after it has withstood impact or penetration. Replace no later than 5 years after being placed into service.

3.5.5 Never alter or modify the shell or suspension system; this reduces the protection factor of the hat.

3.5.6 Do not store in direct sunlight for prolonged periods. Do not use paints, solvents, chemicals, adhesives, gasoline, or similar types of substances on a hardhat; such substances destroy the impact resistance of the hat.

3.5.7 Hair long enough to constitute a hazard while working around moving machinery or rotating tools or equipment must be secured by a hair net or tied back.

a. Hairstyles that make it impossible to wear a hardhat are not permitted.

3.5.8 No baseball caps or any other type of hat is to worn under the hard hat. Other than insulated hard hat liners made for that purpose.

3.6 Hand Protection

3.6.1 Personnel shall wear hand protection appropriate for the task when performing work that may cause injury to the hands.

3.6.2 Refer to guidance in Appendix B for selection of gloves.

3.6.3 The Company furnishes the appropriate chemical resistant gloves for employees engaged in work activities where exposure to crude oil, hydrocarbon products or corrosive material could occur and protection is required.

3.6.4 Gloves are not to be worn when working with in service rotating machinery and equipment.

3.7 Foot Protection

3.7.1 An employee whose work assignment is inside a maintenance shop, process unit and associated control room, storage area, transportation, product handling terminal, warehouse or at field pipeline facilities shall wear protective safety footwear.

a. In addition, other service groups (i.e., HSSE, Measurement, Engineering and staff personnel) are required to wear approved protective footwear when their work activities require entry into any of the previously mentioned work areas.

3.7.2 Each employee must wear protective footwear when working in areas where there is a risk of foot injury due to falling or rolling objects, contact with stationary or sharp objects, as well as when there is a risk of exposure to electrical or chemical hazards.

3.7.3 All protective footwear must meet the latest edition of ASTM F2413 Standards.

a. The boot selection is limited to approved footwear with anti-slip soles and defined heels that are resistant to the absorption of oil and chemical substances.

b. The upper portion of the boot is free of perforated vent holes.

3.7.4 One pair of ASTM approved safety-toed boots is reimbursable up to $250 once every 12-months.

3.7.5 Protective footwear damaged during the performance of work assignments/activities is replaced at no cost to the employee.

a. Local Supervision shall approve the Company contribution toward the purchase of protective footwear on a more frequent basis.

3.7.6 The Company provides safety-toe type rubber boots when working conditions require protection against corrosive materials and/or adverse weather conditions.

a. Safety-toed rubber boots are obtained through an employee's Facility/Area Manager.

3.7.7 The employee will wear approved safety-toed boot with a six inch or greater high top made of leather construction with an oil resistant sole and at least a ¼" heel, while engaged in production, maintenance, pipeline, marine, refinery services, trucking transportation or construction activities.

3.7.8 The wearing of cloth shoes, sneakers, various jogging shoes or other non-work type footwear is allowed only while entering and exiting the worksite from the parking lot across designated hazard free walkways; at the beginning and ending of the work day.

a. Employees are required to change their non-work type footwear to the approved safety footwear upon arrival at their respective control room or shop prior to commencing their workday.

b. Safety footwear must be worn at all times while on duty.

c. Regular or open (thong) type sandals, as well as house slippers, are prohibited in operating areas.

3.8 Hearing Protection

3.8.1 Each employee whose work assignment is in areas with noise levels above 85 decibels (dBA) is required to wear approved hearing protectors.

3.8.2 Warning signs are placed at the entrance of high-noise areas to identify the areas where hearing protection must be worn.

3.8.3 Various types of earmuffs and/or plugs are furnished by the Company and are to be worn in all designated noise areas.

3.8.4 Any employee who is exposed to noise at or above an 8-hour time-weighted average of 85 decibels (dBA) will be included in the hearing conservation program.

3.9 Safe Work Clothing

3.9.1 General Requirements

a. While at Company facilities, customer locations and lease locations FR clothing will be required.

b. The following clothing is prohibited at all GEL locations

1. Excessively frayed FRCs
2. FRCs with holes
3. FRCs saturated with oil or other flammable material

c. The following clothing is prohibited around machinery or rotating equipment

1. Excessively loose clothing
2. Neckties
3. Loose or hanging jewelry

3.9.2 Flame-Resistant Clothing (FRC)

a. Each employee shall wear company approved FRC at all times while on duty at a Company facility.
    1. A facility is identified as any operating/process unit or facility, maintenance shop, underground storage facility, product/crude handling terminal, laboratory, warehouse and field pipeline location where the potential for a flash fire exists.
    2. This includes any control room or office building directly associated with or located within the perimeter of the pipeline or plant facility.

b. Employees shall ensure that FRC meets NFPA 2112 and HRC2 compliance.

c. Clerical/Administrative personnel whose work assignment is located inside a control room or office building may elect to wear normal street-type clothing.
    1. However, they must wear a FR outer garment if their job activity requires entry into a process-related area or field location.

d. Employees may wear their normal street clothing while entering and exiting the worksite from the parking lot along designated pathway at the beginning and ending of the workday.

e. However, employees are required to change into their FR Clothing prior to commencing their workday.

f. In order to fully ensure protection the following practices shall be followed:
    1. Always remain fully clothed while on the job.
    2. The FR coveralls must be properly zipped up fully to the top snap area and the sleeves kept below the elbows to give maximum body protection against possible flash fire or chemical spray.
    3. Employees who have shirt and pant garments instead of the coveralls are required to wear the shirt buttoned to the first button below the collar button, the shirt-tail tucked inside the pants and the shirt sleeves kept below the elbows.

g. FR jackets and insulated coveralls are approved during cold weather.
    1. Other outer garments (i.e., personal jackets, windbreakers, coats of synthetic or polyester material) are not worn over FRC because such garments would impair the protection provided.
    2. All rain gear shall meet ASTM F1891 requirements.

h. Employees shall follow proper washing instructions for their FRCs according to the garment label.

1. Heavily soiled clothing or clothing saturated with hazardous substances should be professionally cleaned or laundered at a company laundry facility.
2. Use any typical home laundry detergent. Do not use tallow soap (anionic detergent).
3. Do not use bleach, starch, hydrogen peroxide, fabric softeners or dryer sheets.
4. Do not launder with other clothing.
5. Wash on Permanent Press or Gentle cycle with warm or cold water.
6. Tumble dry low/delicate and remove promptly.

3.9.3 FRC – Contractors and Visitors

a. Contractor personnel and visitors must wear FRC as described at Company facilities.

1. Contractor firms are informed of the potential risk of flash fire and chemical sprays associated with the work environment and, therefore, are responsible for ensuring that their employees comply with this mandatory program.

b. Smock-type FRC (lab coats) or spare coveralls are available at the facility/location main office for visitors only (this does not include managers, directors or support personnel) who are authorized to enter any pipeline and/or plant process areas.

1. The Company contact representative is responsible for ensuring that visitors are wearing personal FRC or a “check-out” smock coat or coveralls from the facility/location office before entering the facility.
2. All items checked out for a visitor must be returned to the office prior to leaving the facility/location.

3.9.4 Chemical Protective Clothing

a. The Company will furnish a chemical and flame resistant slicker suit (per ASTM F-1891) to employees working in process areas for use during adverse weather, in acid or caustic areas and other specific jobs requiring protection.

b. The Company will furnish a chemical suit to employees working in process areas where specific jobs require maximum protection.

c. Requirements for Corrosive Chemical Areas:

1. The Employee and Facility/Area Manager/PIC shall review and update the PPE Hazard Assessment/Operating Procedures and evaluate the risk of corrosive chemical exposure and determine the PPE required.
2. The Facility/Area Manager may choose to provide a higher level of protection for the employee to wear.
3. The Facility/Area Manager will ensure that all required corrosive chemical PPE are items stocked in the facility warehouse or other locations designated by local supervision.
4. Contractors are required to provide corrosive chemical PPE for their personnel that must meet or exceed the PPE program requirements of this procedure.
5. The Facility/Area Manager will ensure consistent application of this program to ensure that PPE is properly worn in all corrosive chemical areas of each facility or location.

3.9.5 High Reflective Vests

a. HSSE in conjunction with Operations shall conduct a hazard assessment and determine if a vest needs to be made of FRC materials.

b. Reflective vests shall be worn when (not limited to):

1. Working around heavy equipment (i.e. signal person),
2. Working near roadways or road construction projects,
   i. ANSI Class 2 vest required near traffic between 25-50 mph or in low visibility areas.
   ii. ANSI Class 3 vest required near traffic exceeding 50 mph or in no visibility areas.
3. Controlling access/egress points within or near our facilities (i.e. traffic control).
4. Working near active railcar movements, loading or unloading operations.
5. Assisting with emergency service activities, etc.

c. High-visibility safety vests should be replaced when they become faded, torn, dirty, soiled, worn, or defaced, or if they are not visible at 1,000 feet day or night.

3.9.6 Special Requirements for Welders

a. Durable FR material (such as treated cotton, Roban, PBI/Kevlar, Leathers or equivalent materials) may be worn for a welder's outermost clothing.

b. Shirt-tails are NOT required to be tucked into pants.

c. Welding CAPS are NOT required to be made of a FR fabric.

3.10 Personal Flotation Devices (PFD)

3.10.1 Where required by Business Unit, the Company shall provide appropriate Personal Flotation Devices (PFDs).

a. All PFD's will be worn snugly and securely fastened.

b. Prior to and after each use, PFDs shall be visually inspected for defects which would alter their strength or buoyancy. Defective PFDs shall not be used.

c. Visual Inspection of PFDs shall ensure:

1. USCG label is legible.
2. All hardware and straps are in good shape, are firmly attached and are in working order.
3. There are no leaks, mildew, lumpy or hardened buoyancy material and oily saturation in the fabric.
4. There are no rips or tears in fabric.

CAUTION:

- **Inflatable life vests are prohibited.**

3.10.2 Onshore Pipeline and Terminal Requirements

a. All personnel will wear a USCG approved Type III PFD with proper reflective material, whistle and Personal Marker Light (PML) when:

1. Working outside a handrail or location without handrail protection over/near water;
2. While on the dock/boat landing;
3. Loading or unloading cargo from any boat, barge or other waterborne structure;
4. Operating any watercraft alone or riding in any open/semi-open watercraft;

3.10.3 Gulf of Mexico (GOM) Requirements

a. All personnel will wear a USCG approved Type I PFD during personnel transfer by personnel basket or swing rope over open water and while riding in the life boat.

1. Type I PFDs shall have reflective tape, a Personal Marker Light (PML) and a whistle attached.

b. ll personnel will wear a USCG approved Type I PFD or Type V Work Vest when:

1. Working outside a handrail or location without handrail protection over/near water;
2. Loading or unloading cargo from any dock, boat, barge or other waterborne structure; or
3. At any point below the Cellar Deck.

4.0 References & Revisions

4.1 References

4.1.1 29 CFR 1910.132 – Hazard Assessment

4.1.2 29 CFR 1910.133 – Eye and Face Protection

4.1.3 29 CFR 1910.135 – Head Protection

4.1.4 29 CFR 1910.136 – Foot Protection

4.1.5 29 CFR 1910.138 – Hand Protection

4.1.6 29 CFR 1910.269 – Electrical Power

4.1.7 29 CFR 1926.106 – Working over or near water.

4.1.8 ANSI/ISEA 105-200 – Hand and Arm Protection

4.1.9 ANSI Z89.1 – Standard for Head Protection

4.1.10 ANSI Z87.1 – Standard for Safety Glasses

4.1.11 Latest Edition ASTM F2413– Safety Shoes

4.1.12 ASTM F1891 – Standard Specification for Arc and Flame Resistant Rainwear

4.1.13 NFPA 70 E – Workplace Electrical Safety

4.1.14 NFPA 2112 – Flame Resistant Clothing

4.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
12/01/2017	All	Complete revision of PPE procedure and forms.
04/09/2018	Appendix B PPE Form 100	Revised PPE Form 100 to include online ordering guidance and exclusion of Wiley X and Titanium Frames
05/03/2021	3.1.5 3.1.8 3.1.93.3.2 Throughout 3.4.2 3.4.5 3.5.4 3.5.6 Throughout 3.7.5 3.7.7 3.8 3.9 3.9.2 3.9.5 3.9.7 3.10 4.1.12	Responsibility of Facility/Area Manager/PIC to assure the adequacy, maintenance and sanitation of assigned PPE. NEW – requirements for H_2S Monitors NEW – requirements for intrinsically safe flashlights Added acceptable PPE Hazard Assessment Documentation to include: Job Safety Analysis (JSA-100), Job Plan Form (JP-100), and Safe Work Permit. Update Fire Retardant to Flame Resistant Add weed trimming/edging to Face Shield requirements Update Prescription Eye Protection requirements Add marking in-service date of shell and suspension in hardhats; add replacement requirements: Suspension System: No later than 12 months; Shell: No later than 5 years. Add: Do not store in direct sunlight for prolonged periods. Update Safety Toed Shoe/Boot to safety-toed boots Remove report requirements for replacement boots Simplified safety-toed boot description of requirements Remove Note describing potential hearing protection areas Updated prohibited clothing at GEL locations; Add loose or hanging jewelry to prohibited clothing around machinery or rotating equipment. Remove jewelry restrictions, already covered in 3.9; (g)(2) Add: All rain gear shall meet ASTM F1891 requirements. (h) add laundering tips Add requirement to conduct a hazard assessment when determining vest requirements Add ANSI Class 2 & 3 Requirements Remove: Special Requirements for Welding on In-Service Thin Wall Piping Section Add: Personal Flotation Devices (PFD) Section Add Reference: ASTM F1891 – Standard Specification for Arc and Flame Resistant Rainwear
07/14/2022	2.0 3.1.8 3.4.5 a. 3.7.4	Removal of redundancies. Addition of reference to HSSE_06.4P-Hydrogen Sulfide. Update reimbursement of prescription safety glasses to $295. Update reimbursement of safety-toed boots to $250.
08/23/2022	3.5.2	Add: For all trucking terminals, head protection shall be worn inside shops having falling object hazards
05/17/23	3.3.2	Update JSA to JSHA and remove Safe Work Permit
08/08/24	3.4.5 a.	Update reimbursement of prescription safety glasses to $370.

Appendix A. Eye and Face Protection Selection Chart

Eye and Face Protection Selection Chart		
Source	**Assessment of Hazard**	**Protection**
Impact	Flying fragments, objects, large chips, particles of sand, dirt, etc.	Spectacles with side protection, OTGs, goggles, face shields. See notes (1), (3), (5), (6), (10). For severe exposure, use faceshield.
Heat	Hot sparks	Faceshields, goggles, spectacles with side protection. For severe exposure use faceshield. See notes (1), (2), (3).
	Splash from molten metals	Faceshields worn over goggles. See notes (1), (2), (3).
	High temperature exposure	Screen face shields, reflective face shields. See notes (1), (2), (3).
Chemicals	Splash	Safety Goggles. For severe exposure, use face shield. See notes (3), (11).
	Irritating mists	Special-purpose goggles.
Dust	Nuisance dust	Safety Goggles. See note (8).
Light and/or Radiation		
- Welding: Electric Arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes (9), (12).
- Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note (9).
- Cutting, Torch Brazing, Torch Soldering	Optical radiation	Spectacles or welding face-shield. Typical shades, 1.5-3. See notes (3), (9).
- Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable. See notes (9), (10).

Notes for Eye and Face Protection Selection Chart:

(1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.

(2) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.

(3) Faceshields should only be worn over primary eye protection (spectacles or goggles).

(4) As required by the standard, filter lenses must meet the requirements for shade designations in 1910.133(a)(5). Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

(5) As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.

(6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.

(7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
(8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
(9) Welding helmets or faceshields should be used only over primary eye protection (spectacles or goggles).
(10) Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
(11) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
(12) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

Appendix B. Glove Selection Guide

Use this chart to choose the appropriate type of protective glove for a task. The Glove Selection and Usage Chart also provides advantages and disadvantages for specific glove types. This guide was prepared for laboratory researchers but is helpful for all people working with hazardous materials. Always Read the Safety Data Sheets (SDS) for each chemical involved.

Glove Selection & Usage Chart	
What to Do	**How to Do It**
1. Identify the hazards of the material(s) you'll be working with.	Base selection of glove type and material on the type of exposure and nature of the hazard. Some chemicals can easily penetrate gloves that work very well for other chemicals. Consider these factors: - Chemical Type - pH - Toxicity - Temperature extremes, cryogenic properties - Physical hazards (sharps, piercing objects) - Infectious potential of biological hazards
2. Determine if you'll have incidental or extended contact with the hazardous materials.	A. Incidental contact includes these situations: - Accidental spills or splashes - Accidental overspray from a dispensing device - Handling infectious agents that require barrier protection - To prevent contamination of materials during handling B. Extended contact includes these situations: - Handling highly contaminated materials - Submerging hands in a chemical or other hazardous substance - Need for physical protection from temperature extremes or sharp/piercing objects If you will have incidental contact, go to the Step 3. If you will have extended contact, go to Step 4.
3. For incidental contact, follow these selection guidelines.	1. Type of glove: Disposable, surgical-type gloves are appropriate for incidental contact. 2. Nitrile gloves are preferred over latex because of their chemical resistance, their tendency to visibly rip when punctured, and to prevent possible latex allergies. 3. Disposable glove usage: - Check for rips or punctures before use. - Remove and replace gloves immediately with new ones when a chemical spills or splashes on them. - Never wash or reuse disposable gloves. - Always remove glove before touching common objects such as doorknobs, phones, or elevator buttons.
4. For extended contact, follow these guidelines.	1. Type of glove: More substantial gloves are required for extended use. 2. Norfoil gloves are recommended for highly toxic materials and materials that are absorbed through the skin. See the Glove Selection Chart below for advantages and disadvantages of commonly used gloves for extended contact. 3. Reusable glove usage: Many gloves intended for extended contact are reusable. Check the gloves for: - Rips or punctures before and after each use - Prior contamination - Signs of degradation (change in color or texture) - Replace gloves as soon as signs of degradation appear. - Wash after removal and air dry in the laboratory.

Glove Selection & Usage Chart	
What to Do	**How to Do It**
	4. Consider wearing inner surgical gloves for extra protection.
5. Dispose of used and damaged gloves according to whether or not they're contaminated with a hazardous material.	ALWAYS wash your hands after removing gloves.

Glove Comparison Chart		
Glove Material	**Intended Use**	**Advantages and Disadvantages**
Latex (natural rubber)	Incidental contact	- Good for biological and water-based materials. - Poor for organic solvents. - Little chemical protection. - Hard to detect puncture holes. - Can cause or trigger latex allergies
Nitrile	Incidental contact (disposable exam glove) Extended contact (thicker reusable glove)	- Excellent general use glove. Good for solvents, oils, greases, and some acids and bases. - Clear indication of tears and breaks. - Good alternative for those with latex allergies.
Butyl rubber	Extended contact	- Good for ketones and esters. - Poor for gasoline and aliphatic, aromatic, and halogenated hydrocarbons.
Neoprene	Extended contact	- Good for acids, bases, alcohols, fuels, peroxides, hydrocarbons, and phenols. - Poor for halogenated and aromatic hydrocarbons. - Good for most hazardous chemicals.
Norfoil	Extended contact	- Good for most hazardous chemicals. - Poor fit (Note: Dexterity can be partially regained by using a heavier weight Nitrile glove over the Norfoil/Silver Shield glove.
Viton	Extended contact	- Good for chlorinated and aromatic solvents. - Good resistance to cuts and abrasions. - Poor for ketones. - Expensive.
Polyvinyl chloride (PVC)	Specific use	- Good for acids, bases, oils, fats, peroxides, and amines. - Good resistance to abrasions. - Poor for most organic solvents.
Polyvinyl alcohol (PVA)	Specific use	- Good for aromatic and chlorinated solvents. - Poor for water-based solutions.
Stainless steel Kevlar Leather	Specific use	- Cut-resistant gloves. - Sleeves are also available to provide protection to wrists and forearms.

Glove Comparison Chart		
Glove Material	**Intended Use**	**Advantages and Disadvantages**
		- (If potential for biological or chemical contamination: wear appropriate disposable gloves on top of your cut- resistant gloves and discard after use).
Cryogenic Resistant Material Leather	Specific use	- For use with cryogenic materials. - Designed to prevent frostbite. Note: Never dip gloves directly into liquid nitrogen.
Nomex	Specific use	- For use with pyrophoric materials. - Consider wearing a flame-resistant glove such as a Nomex 'flight' glove with a thin nitrile exam glove underneath.

04.5P-Fall Protection

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors.

2.0 Purpose

- The purpose of this procedure is to protect Company employees and contractors from falls by providing requirements for selecting, inspecting and using fall protection systems and equipment.

3.0 Procedure

3.1 Definitions

3.1.1 Competent Person

A person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.

3.1.2 Qualified Person

A person who, by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the product.

3.2 Training

3.2.1 The Facility/Area Manager shall ensure that GEL employees are trained in accordance with this procedure.

3.2.2 Employees who may be required to use personal fall protection shall be trained in accordance with this procedure.

3.2.3 Retraining must be conducted as new equipment becomes available or as equipment/workplace changes occur.

3.2.4 Training must be conducted by a qualified individual and include the following information:

a. The nature of fall hazards;

b. Fall hazard identification and control;

c. Methods of fall restraint;

d. Correct procedures for installing, inspecting, operating, maintaining, and disassembling the personal fall protection systems;

e. Correct use of personal fall protection systems and equipment, including, but not limited to, proper hook-up, anchoring, and tie-off techniques, methods of equipment inspection, inspection documentation and storage, as specified by the manufacturer;

f. Equipment use and limitations;

g. Correct procedures for handling, storage, and securing of tools/materials;

h. Overhead protection for workers below the work site, and

i. Safe removal of injured workers.

3.3 Minimum Fall Protection Height Requirements

3.3.1 Hazard controls (e.g., guardrails, etc.) shall be considered during the hazard assessment and implemented prior to the selection and use of fall protection equipment.

3.3.2 GEL employees or contractors must use fall protection equipment while performing work, maintenance or construction at unprotected heights of four feet (4') or greater unless working in a permanently guarded structure.

a. Light work from a ladder requiring two hands is permitted according to HSSE_05.4P-Ladders, Working from a Ladder Section.

3.4 Types of Fall Prevention/Protection Equipment

3.4.1 Appropriate use of fall protection shall be determined during the hazard assessment.

3.4.2 Examples of fall prevention systems include:

a. An aerial lift provided with a restraint system or body belt with tie-off point.

b. Guardrail with a toeboard, midrail, and toprail.

c. Hole/opening covers.

d. Warning lines.

e. Safety monitoring systems.

f. Safety nets.

g. Travel arrest system.

3.4.3 Personal fall arrest systems include:

a. Anchorage or Anchor Points,

b. Connectors (self-locking snap hooks, carabiner, or D-ring).

c. Properly fitted, full body harness with:

i. Lanyard/Lifelines.

ii. Deceleration device,

iii. Rope grabs, and

iv. Or a suitable combination of these.

WARNING:

- **AN IMPROPERLY WORN HARNESS WILL NOT PROTECT YOU AS DESIGNED IN THE EVENT OF A FALL.**
- **IN THE EVENT OF A FALL, SUSPENSION IN AN UPRIGHT POSITION LONGER THAN FIVE MINUTES CAN BE FATAL.**

3.4.4 Body belts are prohibited as part of the personal fall arrest system.

3.4.5 Fall/Travel Restraint System

A combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support to eliminate the possibility of a worker going over the unprotected edge or side of a walking-working surface.

3.4.6 Anchorage or Anchor Points

A secure point of attachment for lifelines, lanyards or deceleration devices, which is independent from the means of supporting or suspending the employee. An anchorage point should be separately provided for each employee, or when designated to accommodate more than one employee, should be capable of supporting 5,000 lbs. times the number of employees it needs to accommodate. The anchorage should be located directly above the workers head to eliminate the hazard of pendulum type swing falls. Anchorages should be located at or above the worker's shoulder level and should be free from sharp edges to avoid cutting the lanyard or lifeline.

a. Extreme caution must be used in selecting the fall protection system's anchor points. The use of non-locking snap hooks as part of personal fall arrest systems is prohibited.

WARNING:

EVALUATE ANCHOR POINTS AND KNOW THE LOAD BEARING CAPACITY BEFORE TIE-OFF. WHEN IN QUESTION ASK A SUPERVISOR OR MANAGER FOR GUIDANCE. THE FOLLOWING LIST INCLUDES STRUCTURES AND ITEMS THAT SHOULD NEVER BE USED AS ANCHORAGE POINTS FOR A PERSONAL FALL PROTECTION SYSTEM:

- STANDARD RAILINGS
- ELECTRICAL CONDUIT OR CABLE TRAYS
- PLUMBING
- WIRING HARNESSES
- INSULATED PIPING
- FANS
- LADDERS/RUNGS
- LIGHT FIXTURES
- PIPE NIPPLES
- DUCTWORK OR PIPE VENTS
- HEATED PIPING
- VENTS
- ROOF STACKS

3.4.7 Lanyards and Lifelines

a. Lanyards or lifelines must be attached to the anchorage in a manner that does not reduce their strength.

NOTE:
Knots will reduce the strength of the lanyard or lifeline by as much as 50%.

b. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 lbs. When vertical lifelines are used, each worker has to be attached to a separate lifeline.

c. Lanyards or lifelines must be anchored in a way that ensures the stopping distance is short enough to prevent the wearer from falling or swinging into equipment nearby or below.

3.4.8 All fall protection equipment such as full body harnesses, lanyards, life lines, hand and midrails must be designed and rated for fall protection and conform to ANSI/ASSE Standard Z 359.1 (Fall Protection Code). Personal fall arrest systems must limit the arresting force to 1,800 lbs. when used with a body harness.

3.4.9 Fall protection devices can be used only to protect employees and never to hoist material(s).

3.5 Walking/Working Surfaces

3.5.1 A same-level fall occurs at the same level where you are working, walking or standing and does not result in falling to a lower level. Same-level falls are most often the result of poor housekeeping, slight elevation changes, or uneven working surfaces. To prevent falls, the employee must keep work-areas hazard free:

a. Remove tools, extension cords, welding leads, rope, etc. from across walkways, stairways and pedestrian traffic areas, and place them out of the way or elevate them out of the walk or work areas. If items cannot be moved or elevated, flag with high-visibility material.

b. Pick up and remove usable and waste material such as pipe, conduit, welding rods, gaskets, insulation, scrap metal or wood.

c. Pay attention to weather-related hazards such as mud and gravel or small stones at work-site walking surfaces.

d. Elevation changes or uneven working surfaces shall be marked with striping and/or visible markings.

CAUTION:

Make yourself and coworkers aware of the surroundings prior to beginning each work assignment. If you recognize hazardous conditions that could cause a fall:

- **Barricade, guard and flag the hazardous area according to Section 3.7-Open Holes.**
- **Inform coworkers of the hazard so they can protect themselves.**
- **Report the hazard to your supervisor immediately.**

3.6 Prevention of Falls to a Lower Level

3.6.1 A lower-level fall is a fall from one surface to a lower level. Conditions or work assignments may expose you to a lower level fall, some examples include:

a. On unprotected pipelines, tanks, scaffolds, railcars, tanker trucks, vessels, stairs, ladder, or excavations/trenches.

b. All flat and low sloped roof locations when working within 6 feet of the roof's edge or during roof repair or maintenance.

c. Hoist areas

i. When any portion of a guardrail system, gate, or chains is removed, and an employee must lean through or over the edge of the access opening to facilitate hoisting, the employee is protected from falling by a personal fall arrest system.

d. Areas 4 feet and greater above dangerous (i.e. rotating or moving) equipment.

i. Less than 4 feet, employees will require a guardrail or travel restraint system, unless the equipment is guarded to eliminate the hazard.

e. All exterior and interior equipment platforms.

f. All exterior and interior fixed ladders.

g. All tasks requiring use of the articulating man lifts.

h. All tasks requiring employees to lean outside the vertical rails of a ladder (e.g., painting, lightbulb replacement, etc.).

3.6.2 The following is required to prevent fall-related injuries and fatalities from lower level falls:

a. Guardrails systems;

i. Toprail must be 42 in. (+/- 3 in.) in height and capable of withstanding at least 200 lbs. applied in any direction with less than 2 inches of deflection

ii. Midrail must be installed midway between top of guardrail and the walking surface and capable of withstanding at least 150 lbs. applied in any direction

b. Travel restraint systems; or

c. Personal fall arrest systems

3.7 Open Holes

All open holes must be covered, barricaded with signage posted properly identifying reason for barricade or have an attendant assigned. If an open hole is found that cannot be immediately barricaded, identify an Open Hole Attendant / Hole Watch, with no other duties and ensure the person is equipped with adequate fall protection at all times. The attendant shall remain in place until the open hole can be properly barricaded, repaired and/or secured.

3.7.1 Covers for open holes or floor openings must:

- Be capable of supporting at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.
- Secure at the time of installation to prevent displacement by the wind, equipment, or employees.
- Marked with the word HOLE or COVER to provide warning of the hazard.

3.8 Barricading

3.8.1 To prevent the flow of personnel into hazardous areas, barricades must:

- Comply with section 3.6.2 – guardrail systems above
- Have signage posted properly identifying the reason for barricade.

3.8.2 Wire Rope used as Temporary Barricade

- Wire rope must be at least ¼ inch in diameter, clamps must be properly installed and shall be flagged at not more than 6-foot intervals with high-visibility material.

WARNING:

- **CAUTION/DANGER TAPE OR ROPE SHALL NOT BE USED AS A TEMPORARY GUARDRAIL.**

3.8.3 Guarding of an Open Hole:

- If an open hole is found that cannot be immediately barricaded as described above, identify an Open Hole Attendant / Hole Watch, with no other duties − and ensure that the person is equipped with adequate fall protection at all times.

3.9 Protection from Falling Objects

3.9.1 When working from elevated areas, employees must ensure that tools and materials are secured to avoid potential injury to workers below.

3.9.2 Employees should avoid working directly below work being performed.

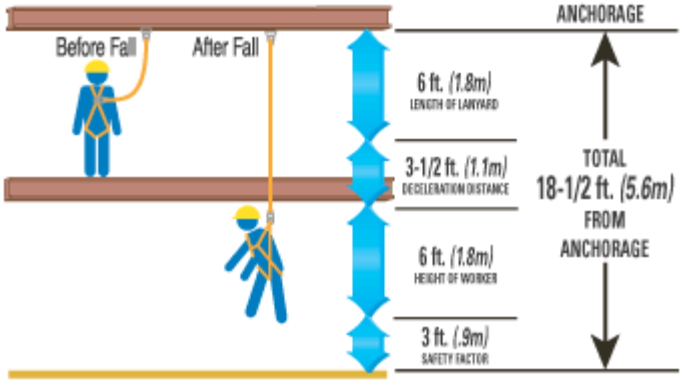
When toeboards are used as falling object protection, they must be erected along the edge of the overhead working surface at a distance great enough to protect workers below. Toeboards must be at a minimum of 4 inches in height and able to withstand a force of at least 50 lbs.

3.9.3 When working on grating, cover the area to prevent falling objects from passing through.

3.10 Fixed Ladders (extending more than 24 feet above a lower level)

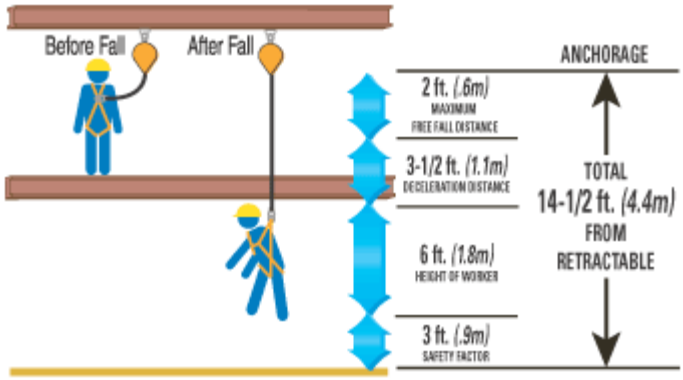
3.10.1 By November 18, 2036, all fixed ladders that extend more than 24 feet shall be equipped with a personal fall arrest system or a ladder safety system. Refer to HSSE_05.4P – Ladder Safety for additional information.

3.11 Fall Distance Calculations



3.11.1 Using a Shock-Absorbing Lanyard and D-Ring Anchorage Connector

- First, add the length of the shock-absorbing lanyard (6 ft.) to the maximum elongation of the shock absorber during deceleration (3-1/2 ft.) to the average height of a worker (6 ft.).
- Then, add a safety factor of 3 ft. to allow for the possibility of an improperly fit harness, a taller than average worker and/or a miscalculation of distance.
- The total, 18-1/2 ft. is the suggested safe fall clearance distance for this example.



3.11.2 Using a Retractable Lifeline

- First, add the maximum free fall distance (2 ft.) with a retractable lifeline to the maximum deceleration distance (3-1/2 ft.) to the average height of a worker (6 ft.).
- Then, add a safety factor of 3 ft. to allow for the possibility of an improperly fit harness, a taller than average worker and/or a miscalculation of distance.
- The total, 14-1/2 ft. is the suggested safe fall clearance distance for this example.

NOTE:
When using a retractable lifeline, the distance is calculated from the point where the retractable attaches to the back D-ring of the worker's harness.

3.12 Inspection and Maintenance

3.12.1 It is the responsibility of the Facility/Area Manager/Person in Charge (PIC) to ensure that fall protection equipment is properly inspected, stored and maintained as required by this procedure and recommended by the manufacturer.

3.12.2 All Fall Protection Components will be marked on the manufacturer's tag with the date placed into service. Fall Protection Components will be replaced no later than 5 years after being placed into service.

3.12.3 Prior to use, it is the responsibility of the employee to conduct fall protection equipment inspections as required in this procedure and recommended by the manufacturer.

3.12.4 A visual inspection shall be performed on fall protection equipment prior to each use, to include:

a. Lanyard and harness webbing must be inspected for:
   i. Frays
   ii. Cuts
   iii. Burns
   iv. Chemical damage
   v. Excessive wear
   vi. Manufacturer's Label is present and legible

b. Latches, hooks, D-rings, and other hardware shall be inspected for:
   i. Sharp edges
   ii. Cracks
   iii. Corrosion
   iv. Bent/damaged parts
   v. Heat damage
   vi. Any other visible signs of damage

3.12.5 Damaged, worn, or otherwise inoperable equipment shall be immediately removed from service, and the Facility/Area Manager/Person in Charge (PIC) will be notified.

3.12.6 Fall protection equipment shall be inspected and documented on FP-100 – Fall Protection Inspection Checklist by a competent person at a minimum of at least annually, not to exceed 12 calendar months as recommended by the manufacturer.

3.12.7 Fall protection equipment shall be stored in a clean, dry area away from sunlight or UV rays.

3.12.8 Dirty harnesses and lanyards should be washed by hand in warm soapy water and be rinsed in clean warm water and hang dried.

3.12.9 Hardware should be stored to prevent corrosion and damage to the equipment.

3.12.10 If any of the fall protection components are subjected to impact loading, the equipment shall be removed from service immediately and sent to the HSSE Department.

3.13 Fall Rescue Plans

3.13.1 The Facility/Area Manager/Person in Charge (PIC) shall ensure that a fall rescue plan has been documented on FP-101 – Fall Rescue Plan prior to any work, maintenance, or construction that requires the use of personal fall arrest system.

3.13.2 An FP-101 - Fall Rescue Plan will be developed by GEL employees and contractors that use personal fall arrest systems. The fall rescue plan must:

a. Be developed by a competent person specifically for the work to be performed on site.

b. Identify emergency services, properly trained rescue personnel and first aid trained personnel.

c. Comprehensively include the details of other protective measures to be taken.

d. Be submitted to the Facility/Area Manager/Person in Charge (PIC), and the Regional HSSE Manager/Coordinator for review and approval prior to starting work.

e. Maintained up-to-date and at the job during the duration of the job.

3.13.3 Changes to the plan must be reviewed and approved by the Facility/Area Manager/PIC and the Regional HSSE Manager/Coordinator.

3.13.4 The competent person must oversee the implementation of the plan on the job site.

4.0 References and Revisions

4.1 References

4.1.1 29 CFR 1910.28 – Duty To Have Fall Protection And Falling Object Protection

4.1.2 29 CFR 1910.29 – Fall Protection Systems and Falling Object Protection-Criteria and Practices

4.1.3 29 CFR 1910.30 – Training Requirements

4.1.4 29 CFR 1910.140 – Personal Fall Protection Systems

4.1.5 29 CFR 1926.502 – Fall Protection Systems Criteria and Practices

4.1.6 29 CFR 1926.451 – Scaffolding General Requirements

4.1.7 ANSI/ASSE Standard Z 359.1 – Fall Protection Code

4.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
11/02/2020	All	Complete Revision of Fall Protection Procedure & Forms

05.3P-Cranes and Hoists

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors who operate and maintain cranes and hoists.

2.0 Purpose

To promote safe work practices that protect personnel during lifting operations. This procedure establishes company standards for compliance with federal, state and local requirements.

3.0 Definitions

3.1 Anti Two-block/Hoist Limiter Switch – A device which automatically prevents damage and load failure from contact between the load block, overhead ball, or similar component.

3.2 Crane – Power or manually operated equipment that can hoist, lower, and horizontally move a suspended load.

3.3 Load – The total weight exerted on the load block or hook.

3.4 Load Block – Assembly of hook or shackle, swivel, bearing, sheaves, pins and frame suspended by hoisting cable or chain.

3.5 Load Rating Chart – A graphic chart used to indicate the safe working load of the crane/hoist established by the manufacturer. The load rating chart is securely fixed in a location easily visible to the operator.

3.6 Personnel Transfer Basket – Equipment used to transfer personnel from a vessel to an offshore facility (i.e. Billy Pugh transfer basket).

3.7 Personnel Work Basket / Platform – Equipment used to hoist personnel when other conventional means would be more hazardous. CH-104 - Personnel Work Basket/Platform Hoisting Form must be utilized.

3.8 Pre-Lift Meeting – A meeting conducted prior to making a lift involving all affected personnel to ensure all planning elements have been fulfilled and all personnel understand their duties.

3.9 Rated Capacity – The Safe Working Load within crane rated capacity for the given operating conditions.

3.10 Shock Load – The sudden force exerted when an object suddenly accelerates and decelerates.

3.11 Tagline – A non-stretching rope attached to a lifted load for the purposes of controlling spinning and pendular motions.

4.0 Qualifications

4.1 Qualified Crane Operator

4.1.1 Responsible for the safe operation of the crane and is familiar in lifting loads with slings, rigging hardware and facilitating JSHAs and critical lift plans.

4.1.2 Must meet the following criteria:

a. Successful completion of a written examination which includes the safe operating procedures for the particular type of equipment the Qualified Crane Operator will be operating and have a technical understanding of the appropriate regulations regarding crane operations.

b. Successful completion of a practical examination showing the applicant has the skills to safely operate the equipment, including the ability to properly use load chart information and recognize items required during inspection.

c. Certified by a qualified training organization.

d. Receive training every 4 years.

e. Be a Qualified Rigger.

f. Meet company physical requirements.

4.2 Qualified Rigger

4.2.1 Responsible for the safe use of slings, rigging hardware and taglines.

4.2.2 Must meet the following criteria:

a. Successful completion of a practical rigging skill evaluation that requires the use of rigging equipment in safe configurations. The actual or simulated operation shall enable personnel to demonstrate basic knowledge and skills at a level that ensures the safety of personnel and equipment.

b. Receive training every 4 years.

c. Meet company physical requirements.

4.3 Signal Person

4.3.1 Responsible for providing signals to the crane operator. Must wear high visibility vest.

4.3.2 A Qualified Rigger that meets the following criteria:

a. Knows and understands the type of signals used at the worksite (See Appendix B for additional information);

b. Understands the operations and limitations of the equipment, including crane dynamics involved in swinging, raising, lowering and stopping loads.

4.4 Relay Signal Person

4.4.1 A supporting Signal Person used to relay hand signals designated by Signal Person, as required.

4.5 Competent Person

4.5.1 A person designated by Genesis who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

5.0 Procedures

5.1 General Crane Lifting Guidelines

5.1.1 Qualified Crane Operator will know the weight of the load prior to the lift. When the weight of the load is not readily available, the weight will be calculated in the field, or if additional support is needed, the PIC will contact Operations Management and Engineering.

5.1.2 Qualified Crane Operator, Qualified Rigger or Signal Person will check the travel path prior to the lift to ensure that personnel are notified, in safe positions and clear of obstructions.

5.1.3 Qualified Crane Operator and Qualified Rigger will ensure loads are securely connected and balanced prior to lifting.

5.1.4 Qualified Rigger will ensure taglines are attached to the lowest point of the load to ensure control of the load. Taglines will NOT be tied off to fixed equipment as hold back lines.

5.1.5 Qualified Crane Operator should lift load only a few inches from the resting surface to check and verify the stability of the load.

5.1.6 Qualified Crane Operator will not initiate lifts with kinks or twists in the rigging.

5.1.7 Qualified Rigger will ensure proper padding, blocking and protective devices are used to avoid sling damage.

5.1.8 Qualified Rigger or Signal Person will ensure all persons remain at a safe distance away from the lifted load at all times, barricade area if needed.

5.1.9 No persons are allowed under the load at any time.

5.1.10 No persons are allowed to ride the hook or load.

5.1.11 Qualified Crane Operator and Qualified Rigger will ensure loads are not lifted or moved with loose or dangling slings or hooks that could snag and unbalance or drop the load.

5.1.12 The Qualified Crane Operator will not leave the controls of the crane while a load is suspended from the hoist.

a. Exception: The Qualified Crane Operator may leave the controls of the crane during terminal vessel loading/unloading activities in accordance with site-specific procedures.

5.1.13 Only Qualified Riggers or Signal Persons are allowed to give hand signals to the Qualified Crane Operators.

a. Exception: Any person can call an “All Stop” if the lift operation is deemed unsafe.

5.1.14 Signal Person will establish communications (visual, radio, etc.) and/or designate a Relay Signal Person to observe and give notice on clearance of the equipment if the Qualified Crane Operator’s position is not ideal for viewing the entire lifting area.

5.1.15 Qualified Crane Operator will ensure crane booms are lowered to the ground/boom rest and safely shutdown when:

a. There is danger of adverse weather affecting the safe operation of the crane.

b. The Crane Operator and/or the Facility/Area Manager/Person-in-Charge (PIC) feels it is unsafe to operate the crane.

5.1.16 If a helicopter has to land while crane operations are in progress, the crane operator will:

a. Land the load

b. Move the boom away from the heliport or place it in the boom rest

c. Engage the swing lock

d. The crane operator will stand outside the cab while the helicopter lands and will not get back inside the cab until the helicopter departs or shuts down.

i. Exception: In the event of emergency helicopter landing, move the load to a safe location, engage swing lock and exit crane to safe location.

CAUTION:

- **Override of any safety system requires supervisor approval.**

NOTE:

For crane specific safety information regarding safe operation during adverse weather conditions, always consult the owner's manual.

5.2 Hoists

5.2.1 Only Qualified Crane Operators are allowed to operate hoists greater than 1 ton.

5.2.2 Each hoist has its rated load legibly marked on the hoist or load block and clearly legible from the ground or floor with the exception of pedestal cranes.

5.2.3 The weight of the load must be known prior to the lift.

5.2.4 Each electric or pneumatic hoist motor must have a brake arranged so the brake is applied when the power is cut off from the hoist.

5.2.5 Each overhead electric or pneumatic hoist motor must be equipped with an effective enclosed-type Anti Two-Block/Hoist Limiter Switch.

5.2.6 Each wire rope or fiber rope for hoisting drums will be sufficient length that the hoist hook at least reaches the lowest working level.

5.2.7 There are at least three (3) turns of rope on the hoist drum when the hook has reached its extreme limit of travel.

5.2.8 The hoist operator shall not leave their position at the controls while a load is suspended from the hoist.

5.2.9 Loads are lifted in a vertical direction only.

5.2.10 No person is allowed under a suspended load.

5.2.11 All persons will remain a safe distance away from the lifted load at all times.

5.2.12 No persons will be allowed to ride the hook or load.

5.2.13 The hoist operator will visually inspect cranes and hoists for defects or damage prior to each use.

5.2.14 Hoist equipment will be inspected and documented annually. Offshore crane hoists will be inspected and documented in accordance with API RP 2D latest edition requirements.

5.3 Rigging Practices

5.3.1 Rigging Practice Guidelines

a. All lifting and rigging materials must have manufacturer and rated capacity clearly embossed, and should be accompanied by certification documentation. Approved manufacturers of lifting and rigging materials include: USA, Canada, Western Europe, Japan, South Korea, and Taiwan.

b. Chain, rope or non-certified rigging shall not be used for lifting.

c. Wire rope and slings should not contact any rough cut edges or holes such as pad eyes. Rough cut edges must be padded or properly protected to prevent damage. Shackles must be used with all pad eyes.

d. Hook openings shall be turned outward on hook slings and latches must be present and maintained in working order. (See Appendix A)

5.3.2 Taglines

a. A tagline should be of sufficient length, diameter, and strength to allow adequate control of the load by the Qualified Rigger(s). The rope must be kept free of knots or any other obstruction that could cause it to become entangled during the lifting operations. Taglines must be in good condition and visually inspected prior to use. Minimum of two taglines required.

b. Taglines will meet the following minimum criteria:

i. Non-stretching material

ii. 3/8” in diameter

iii. 1200 lb. breaking strength

iv. 15 feet in length

WARNING:

- **DO NOT USE NYLON ROPE OR OTHER STRETCHING MATERIALS. THESE MATERIALS HAVE THE POTENTIAL TO STRETCH AND BREAK AND MAY CAUSE INJURY/DEATH.**

c. The free end of tag lines should not contain anything that is likely to become snagged during lifting operations (e.g., knots or weights).

d. Tag lines should be connected to the lowest practical point on the load whenever possible. If a tag line cannot be attached directly to the load, it must be attached to the shackle end of the sling as near the load as possible.

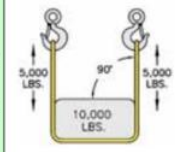
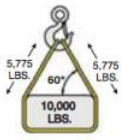
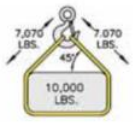
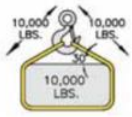
e. Tag lines must be clear of all obstructions before the Signal Person and/or Qualified Rigger divert their attention from the load.

5.3.3 Wire Rope and Slings

a. Wire rope and slings shall be visually inspected prior to each use. Users shall carefully note any deterioration that could result in an appreciable loss of original strength and determine whether further use of the sling would constitute a safety hazard.

b. At no time are load hooks or lines to be used/lowered underwater. If underwater operations are to be performed, the contractor shall furnish the proper submergible cable/equipment.

c. Sling angles will not be less than 30 degrees from the horizontal (or not more than 60 degrees from the vertical).

Tension in the Sling Increases as the Sling Angle Decreases				
Sling Angle (from Horizontal)	90°	60°	45°	30°
Tension Multiplier	1.00	1.155	1.414	2.000
Sling Leg Tension (Lbs. Per Leg)	5,000	5,775	7,070	10,000
Required Sling Capacity (Lbs. Basket Hitch)	10,000	11,550	14,140	20,000

d. NO “field fabricated” slings shall be used.

e. Knots or kinks are not permitted in wire rope or slings for any reason.

f. If any of the below conditions are present, the equipment will be replaced or sent in for inspection, testing, and refurbishment by qualified personnel. All slings that will be permanently placed out of service shall be destroyed and properly disposed of and slings that will be placed out of service temporarily (i.e. recertification process) will be properly tagged “Out of Service”.

   i. Ten randomly distributed broken wires in one rope lay or five broken wires in one strand in one rope lay.

   ii. Wear or scraping of one-third the original diameter of the outside individual wire.

   iii. Kinking, crushing, bird caging or any other damage resulting in distortion of the rope structure.

   iv. Evidence of heat damage.

v. End attachments that are cracked, deformed, or worn.

vi. Corrosion of the rope or end attachments.

vii. Missing, incorrect or illegible sling identification.

g. Wire rope slings shall be properly stored:

i. In a vertical position (hanging) to prevent water intrusion leading to potential corrosion.

ii. Where they will not be damaged by moving or landing loads.

iii. During maintenance or other activities, slings shall be protected or moved to prevent damage or impact from foreign materials.

5.3.4 Synthetic-Web Slings/Straps

a. Synthetic-web sling/straps shall be visually inspected before each use. Users shall carefully note any deterioration that could result in an appreciable loss of original strength and determine whether further use of the sling would constitute a safety hazard.

b. Slings/straps shall be removed from service if any of the following defects are visible:

i. Acid or caustic burns.

ii. Melting or charring of any part of the surface.

iii. Snags, punctures, tears, or cuts.

iv. Broken or worn stitches.

v. Wear or elongation exceeding the amount recommended by the manufacturer.

vi. Distortion of fittings.

vii. Knots in any part.

viii. Missing, incorrect or illegible sling identification.

ix. After one year of service.

c. Ensure that each sling/strap is permanently marked to show:

i. Name or trademark of manufacturer.

ii. Manufacturer's code or stock number.

iii. Rated capacity for types of hitches used.

iv. Type of synthetic-web material.

v. Hand written, or ink embossed markings are not acceptable. Sling tags shall be permanent.

d. Synthetic web slings/straps shall be properly stored:

i. In a vertical position (hanging) to prevent water intrusion leading to potential corrosion.

ii. Where they will not be damaged by moving or landing loads.
iii. During maintenance or other activities, slings shall be protected or moved to prevent damage or impact from foreign materials.
iv. Prior to being placed into service, synthetic web slings/straps shall be stored in a cool, dry environment.

e. The date the Synthetic-web sling/straps is placed in service will be documented on CH-102 to track the one year of service life.

5.3.5 Shackle information:

There are two types of shackles commonly used in rigging. They are the anchor (bow type) shackle and chain ("D" type) shackle. The pin styles commonly used with shackles are screw pins, bolt pins, and loose pins. Shackles, like most other rigging hardware, are sized by the diameter of the steel in the bow section rather than the pin size.

a. Screw pin shackles are to be used when lifting and placing a load. This type of shackle shall be the preferred method when it will be a temporary connection. The screw pin shackle is capable of being used at full working loads to gather multiple leg slings.

b. Bolt type shackles are to be used in permanent or long-term installations. The proper nut and cotter pin shall be used at all times with this type of shackle. The bolt pin shackle is capable of being used at full working loads to gather multiple leg slings.

c. ONLY U.S. forged alloy and/or stainless shackles shall be used. All shackles must have their crown size, manufacturer and rated capacity clearly embossed. (See Appendix A)

d. ONLY properly fitted screw pins shall be used in shackles.

WARNING:

- **UTILIZING IMPROPERLY FITTED SCREW PINS OR REPLACING THE SHACKLE PIN WITH A BOLT MAY LEAD TO CATASTROPIC FAILURE, INJURY OR DEATH.**

e. Shackles should never be used if the distance between the eyes is greater than listed in Appendix A.

f. All screw pins must be straight and completely seated in the shackle.

g. Shackles worn in the crown or the pin by more than 10% of the original diameter shall be discarded.

h. Shackles should never be attached where the load could possibly roll or unscrew the pin during the lifting process.

i. Shackle specifications: see Appendix A

5.3.6 Drum and Bottle Racks will be designed to appropriately secure and safely transport drums and cylinders.

a. All drum racks are to be of sound and workmanlike construction, free of defects.

b. All racks will be built to be inherently stable and not easily tipped on side.

c. All racks will have individual drum securement provisions.

d. Drums shall be properly secured at both top and bottom.

e. Genesis personnel retain the final decision as to rack acceptance/non-acceptance. Drum racks that do not meet this criteria will be returned to the contractor at their expense.

5.3.7 Guidelines for Acceptance of Compressed Gas Cylinder Racks being Shipped Offshore. The following criteria is provided to assist shore based and offshore facility personnel in the determination to accept bottle racks carrying compressed gas to Genesis offshore facilities:

a. All bottle racks to be of sound and workmanlike construction, free of defects.

b. All racks that are greater than 6 ft. in length will have two lifting pad-eyes or lifting hook arrangements for hoisting unit.

c. All racks will be built to be inherently stable and not easily tipped on side.

d. All racks will have individual bottle securement provisions.

e. Bottle keeping bars should be secured by railing or channel slotted into the rack frame held in place by non-load bearing nut/bolt treaded arrangements or safety pins.

f. T-handle bolts or nuts are not acceptable.

g. Gas cylinders should be secured both top and bottom.

h. Racks transporting both Oxygen and Acetylene cylinders will have firewall barriers between the two types of gas bottles.

i. Chain can be utilized only as secondary securement for bottles in any rack.

j. Bottle racks containing manifold cylinders will be equipped with overhead dropped object protection.

k. Bottle racks that will be sent offshore shall not have caster wheels attached to the bottom of the racks.

l. Compressed gas cylinder racks that do not meet these criteria will be removed from Genesis property and returned to the contractor at their expense.

m. Genesis personnel retain the final decision as to rack acceptance/non-acceptance.

5.3.8 Vessels, Docks, Shorebases and Load Rigging/Marking

a. Refer to site specific procedures for dock operations.

b. If there is any question about the safety of the lift, utilize the Stop Work Authority process to resolve the issue and obtain authorization to continue with the lift.

c. It is a recommended practice that loads/equipment delivered to shore-base for shipment offshore be pre-rigged with certified slings/rigging equipment and configured with a one point hook up. The one point hook up should be long enough so that a Qualified Rigger can attach the load to the crane from the deck or ground level.

d. All cargo containers, such as trash baskets, tool baskets, grocery boxes, drum racks, gas cylinder racks, sensitive material bins, hazardous material bins, MPT tanks, cutting boxes, tote tanks and portable racks must be permanently marked with the design "gross" weight capacity and "net" (empty) weight.

e. Palletized materials should be placed in approved cargo containers prior to handling with the crane. Rigging shall not be applied directly to a pallet.

f. Genesis Cargo manifests shall be completed prior to transporting loads to and from offshore facilities and shall include the weight of each lift.

g. Cargo manifests, showing both the loads and their weight shall be communicated to the affected offshore facility and communicated to the Qualified Crane Operator to prepare for the lift(s).

h. Vessel personnel shall maintain radio communication with the Qualified Crane Operator on the platform at all times while lifts are being made to or from the vessel.

i. Vessel personnel should direct the placement of each load onto the deck of the vessel, taking into consideration balance, actual and anticipated sea conditions, and subsequent load changes. However, the load placement location must not cause the Qualified Crane Operator to exceed the safe working limits of the crane (e.g., exceed safe boom angle). The Qualified Crane Operator shall plan the lifts

with the vessel crew and refer to the cargo manifest prior to making the first lift.

j. All weights shall be clearly marked on both the load and the cargo manifest before placing the load on the vessel.

   i. All skid-mounted equipment (e.g., welding machines, air compressors, pumps) that exceeds 1,000 lbs. shall be permanently marked with the maximum weight of the equipment.

k. Loads coming from vessels shall be raised only high enough to clear the sides of the vessel before swinging the load over the water. Loads made to a vessel shall be lowered over the water until just before swinging the load over the vessel.

CAUTION:

- **To aid in preventing incidents while backloading equipment offshore, ensure there is adequate space for backloading and landing equipment or personnel on vessel decks. Weather and sea conditions and safety of vessel personnel should also be considered in the lift planning.**

5.4 Wire Ropes & Pendant Line Replacement Guidance

5.4.1 Wire Ropes (main, auxiliary and boom lines) shall be replaced every 3 years.

5.4.2 Pendant Lines shall be replaced every 5 years.

5.5 Hoisting Personnel in a Work Basket/Platform

CAUTION:

- **Personnel lifts will not be conducted on derated cranes.**

5.5.1 Crane suspended personnel work basket/platforms are only used when conventional means to reach worksites are more hazardous or cannot be used because of structural design or worksite conditions.

5.5.2 A Job Safety and Hazard Analysis (JSHA-100) and CH-104 - Personnel Work Basket/Platform Hoisting Form is completed and utilized each time a personnel work basket /platform is used.

5.5.3 Personnel occupying the work basket/platform must wear appropriate fall protection and be tied off to a sufficient anchor point. 100% tie-off required.

5.5.4 All employees working in and around personnel work basket/platforms must wear hard hats. Personnel inside work basket/platform must have hard hat lanyard.

5.5.5 Hoisted personnel are in radio contact or in continuous sight of the Qualified Crane Operator or Relay Signal Person; only one person occupying the work basket/platform gives signals to the Qualified Crane Operator.

5.5.6 Hoisting a personnel work basket/platform is performed in a slow, controlled and cautious manner and is performed only by trained personnel.

5.5.7 Load lines are capable of supporting, without failure, at least five (5) times the maximum intended load.

5.5.8 The personnel work basket/platform is capable of supporting without failure its own weight and at least five (5) times the maximum intended load.

5.5.9 Load and boom hoist drum brakes, swing brakes and locking devices such as pawls or dogs are engaged when the occupied personnel work basket/platform is in a stationary working position.

5.5.10 A plate or other permanent marking will be posted on the personnel work basket/platform that indicates the weight of the work basket/platform and its rated load capacity or maximum intended load.

5.5.11 The total weight of the loaded personnel work basket/platform and related rigging does not exceed fifty (50%) percent of the rated capacity for the load radius and configuration of the crane.

5.5.12 The personnel work basket/platform and suspension system are designed by a qualified engineer or a qualified person who is competent in structural design.

5.5.13 The work basket/platform must be equipped with a guardrail system and be enclosed at least from the toe-board to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch.

a. A grab rail is installed inside the entire perimeter of the work basket/platform.

5.5.14 Access gates do not swing outward during hoisting and are equipped with a restraining device to prevent accidental opening.

5.5.15 Materials and tools for use during a personnel lift are secured to prevent displacement and evenly distributed within the confines of the work basket/platform while the work basket/platform is suspended.

5.5.16 Prior to hoisting personnel

a. A proof test is conducted and documented at each jobsite. Prior to hoisting employees on the personnel work basket/platform, the work basket/platform and rigging must be proof tested to 125% of the work basket/platform's rated capacity. The proof test may be done concurrently with the trial lift.

b. A trial lift is conducted and documented on CH-104 – Personnel Work Basket / Platform Hoisting Form with the personnel work basket/platform unoccupied. The following conditions will be met:

- A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight (may utilize proof test weight) must be made from ground level, or any other location where employees will enter the platform, to each location at which the platform is to be hoisted and positioned.
- The trial lift is conducted immediately prior to placing personnel on the work basket/platform.
- The operator determines that all systems, controls and safety devices are activated and functioning properly.
- The operator determines that no interferences exist and all configurations necessary to reach the work locations allow the operator to remain under the 50% limit of the equipment's rated capacity.
- Materials and tools must be loaded, secured, and evenly distributed within the confines of the work basket/platform while it is suspended. It is necessary to perform a trial lift to ensure the load is evenly distributed.
- A single trial lift is performed at one time for all locations reached from a single setup position.

5.6 Personnel Transfer Basket Requirements

5.6.1 Prior to personnel transfer basket operations, Template JSHA-100 – Personnel Transfer shall be completed to include actual site-specific conditions.

5.6.2 Work shall not be conducted using a Billy Pugh type personnel transfer basket.

5.6.3 All personnel involved with the lift and the PIC must collectively agree that the operation can proceed safely. If any conditions are not conducive for safe operations, utilize stop work authority and DO NOT MAKE THE LIFT.

5.6.4 Personnel transfer general guidelines:

a. Position yourself on deck, clear of the descending basket.

b. Don't put more people in the basket than were intended to ride in it at one time.

c. Wear appropriate floatation device.

d. Place luggage or small tools in bottom center of the basket. Luggage/baggage may need to be sent on an additional transfer.

e. Follow site specific procedures concerning personnel baskets.

f. Keep your knees bent and flexed and be prepared for sudden shifts in position.

g. Never disembark the basket until it has completely landed.

5.7 Critical Lifting – Risk Assessment

5.7.1 An assessment using the criteria listed below will be completed prior to a lift. One or more of the following conditions will constitute a critical lift:

a. Fixed Cranes: The lift is equal to 90% or greater of the load chart capacity at boom angle; excludes auxiliary line operations.

b. Mobile Cranes: While on outriggers, the lift is equal to 85% of the load/tipping capacity based on a critical lift assessment.

c. Lifting loads over operating equipment containing hazardous material.

d. Lifting over control rooms or office buildings.

e. Lifting loads with high cost, long lead times, or project critical which would cause significant business interruption if lost or damaged.

f. Hoisting/Lifting equipment used outside of its normal design and/or operating capacity.

g. Complicated lifts such as limited clearance or multiple maneuvers.

h. Lifts involving multiple cranes. (A Competent Person shall be onsite to direct lifting operations.)

i. Lift that requires the use of a suspended personnel work basket/platform. CH-104 - Personnel Work Basket / Platform Hoisting and Transfer Form must be utilized.

A lift not meeting the above criteria may also be designated as critical if the Qualified Crane Operator or Competent Person deems it necessary.

5.7.2 The assessment shall be completed by personnel designated by the Facility/Area Manager/Person-in-Charge (PIC) which can include facility operations, Qualified Crane Operator, construction or maintenance personnel, and engineering.

5.8 Critical Lift – Safety Plan

5.8.1 Complete CH-103 - Critical Lift Checklist Form for any lifting activity designated as critical. The checklist will verify the following:

a. Load, lifting radius calculations (includes strong to weak side rotation)

b. Setup and foundation

c. Electrical or overhead hazard clearance

d. Operator qualification

e. Crane condition/inspection

f. Signal person and other communication

g. Emergency shutdown/equipment isolation

5.8.2 Additional documentation should be furnished as needed to facilitate planning for specific lifting or operating requirements.

5.9 Critical Lift – Pre-Lift Meeting

5.9.1 Prior to the commencement of any critical lift, the Facility/Area Manager/Person-in-Charge (PIC) shall conduct a pre-lift meeting to ensure all planning elements have been implemented; CH-103 - Critical Lift Checklist Form and JSHA-100, have been fulfilled and affected personnel understand their duties.

5.9.2 Approval is required by the Facility/Area Manager/Person-in-Charge (PIC), the Qualified Crane Operator, Qualified Rigger and other personnel with an assigned role in completing the lift safely.

a. An approval by electronic signature or hand signature on CH-103 is acceptable.

5.10 Crane Rerating and Derating

5.10.1 The rerating or derating of any company owned or leased crane must be documented through the MOC process.

6.0 Inspections

All offshore cranes will be inspected per Craine & Hoist manufacturer guidelines based on the average usage hours per quarter for that platform crane.

6.1 Pre-Use Inspections

6.1.1 Two individuals will visually inspect the crane and rigging for defects or damage as follows:

a. The Qualified Crane Operator shall perform and document a Pre-Use Inspection prior to the first crane use of the day, prior to or during

each change in Crane Operator and then as the Qualified Crane Operator deems necessary during the day for extended operations. The Pre-Use Inspection will be documented on CH-100 - Crane Pre-Use Inspection Form.

b. The Qualified Rigger will visually inspect the rigging equipment (slings, shackles and other lifting hardware) prior to each use.

6.2 Monthly Inspections

6.2.1 Crane and rigging equipment inspections will be conducted as follows:

a. The Qualified Crane Operator will inspect the crane according to CH-101 - Monthly Crane Inspection Form.

b. The Qualified Rigger will inspect the rigging according to the CH-102 – Monthly Wire Rope Sling/Rigging Inspection Form.

6.3 Quarterly (Offshore ONLY)

6.3.1 A quarterly inspection meeting API RP 2D, latest edition requirements must be performed by a qualified, third party crane inspector.

6.4 Annually

6.4.1 An annual inspection meeting OSHA or API RP 2D, latest edition requirements must be performed by a qualified, third party crane inspector at least every 12 months, but sooner if:

a. Problems or concerns are identified by routine inspections,

b. The crane has been subjected to a shock load,

c. The crane has been operated beyond the rated capacity, or

d. The crane has been used improperly or otherwise subjected to unusual stress.

6.4.2 The written results of this inspection are retained on location until replaced with subsequent inspection results, and all discrepancies must be corrected prior to use.

6.5 Infrequent usage offshore cranes minimum inspection requirements:

6.5.1 Pre-use

6.5.2 Monthly, and

6.5.3 Annual.

6.6 Third party rigging and equipment inspection process must be in accordance with OSHA 1910.184, 1926.251 or API RP 2D and reviewed by a Competent Person.

6.7 Completed Inspection Forms shall be maintained in an equipment file at the nearest office or facility and retained as follows:

6.7.1 Pre-use Inspection Forms: 4 years

6.7.2 Monthly Inspection Forms: 4 years

6.7.3 Quarterly Inspection Forms: 4 years

6.7.4 Annual Inspection Forms: Life of Crane

6.8 Any deficiencies found during inspection must be reported to the Facility/Area Manager/Person-in-Charge (PIC) immediately.

6.9 If unsafe conditions are discovered by the inspection, the crane shall be taken out of service or its operation restricted to eliminate the unsafe condition.

6.10 Temporary Cranes

6.10.1 All temporary cranes will meet the same inspection requirements as fixed/permanent cranes and shall not be used to perform personnel lifts.

7.0 Repairs

7.1 Any repairs, including welding, to the critical components of the crane must be conducted following the manufacturer's recommendations, will be validated by a certified third party technician, and must be approved by Facility/Area Manager.

7.2 All parts used during the repairs must meet or exceed the manufacturer's recommendations.

7.3 The following documentation shall be maintained in the Crane Repair Report file for the life of the crane:

7.3.1 Welding Procedures

7.3.2 Welder's Certifications

7.3.3 Material Traceability Report (MTR)

7.3.4 Non-Destructive Examination (NDT) Report

7.4 Field welding, or use of applied heat, shall not be performed on load or sling hooks.

8.0 Mobile Cranes

8.1 Qualified Crane Operator in conjunction with Facility/Area Manager/Person-in-Charge (PIC) will ensure the following:

8.1.1 All mobile crane operations will utilize outriggers.

8.1.2 Lifts on unstable ground are not permitted. When the stability of ground is unknown, use planking or mats.

8.1.3 The lift will be considered critical when the load is equal to 85% the load/tipping capacity while on outriggers based on a critical lift assessment.

8.2 Facility/Area Manager/Person-in-Charge (PIC) is responsible for ensuring equipment complies with the manufacturer's specifications and limitations.

8.2.1 Attachments used with the crane cannot exceed the capacity, rating or scope recommended by the manufacturer.

8.2.2 Accessible areas within the swing radius of the rear of the rotating superstructure of the crane shall be barricaded in such a manner as to prevent workers from being struck or crushed by the crane.

8.2.3 Qualified Crane Operator will ensure support material for outriggers meets manufacturer's specifications.

9.0 Cranes Working Near Overhead Wires

9.1 All overhead wires shall be considered energized until proven de-energized.

9.2 When working near a transmitter tower, the transmitter must be de-energized or tested to determine if an electrical charge can be induced by the crane.

9.3 Precautions will be taken to dissipate induced voltages, when necessary.

9.4 The following restrictions apply to cranes operating near overhead wires except where electrical distribution and transmission lines are de-energized and grounded at the point of work or where insulation barriers (not a part of or an attachment to the crane or its equipment) are erected to prevent physical contact with the lines:

9.4.1 Line voltage equal to or less than 50kV must have minimum clearance of not less than 10 feet.

9.4.2 Line voltage greater than 50kV must have minimum clearance of not less than 10 feet plus 4 inches for each 10kV above 50kV OR twice the length of the line insulator, but never less than 10 feet.

Minimum Clearance Distances

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
Up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 500 to 750	25
Over 750 to 1,000	35
Over 1,000	45

Note: The value that follows “to” is up to and includes that value. For example, 50 to 200 means up to and including 200kV.

9.5 Elevated high-visibility warning lines, barricades or signs can be used if placed indicating the minimum clearance distance indicated in the above chart.

9.6 A dedicated spotter must be used, be positioned to effectively gauge the clearance distance and directly communicate to the operator.

10.0 References & Revisions

10.1 References

10.1.1 OSHA Standards

a. OSHA 29 CFR 1910.179, Overhead and gantry cranes
b. OSHA 29 CFR 1910.180 Crawler locomotive and truck cranes
c. OSHA 29 CFR 1910.184, Slings
d. OSHA 29 CFR 1910.67, Vehicle-mounted elevating and rotating work platforms
e. OSHA 29 CFR 1926.1401 Cranes & Derricks in Construction
f. OSHA 29 CFR 1926.202, Barricades
g. OSHA 29 CFR 1910.178, Powered industrial trucks

10.1.2 API RP 2D (7th Edition) Operation and Maintenance of Offshore Cranes

10.1.3 ANSI A92.2 Vehicle-Mounted Elevating and Rotating Work Platforms

10.1.4 ASME/ANSI B30.5 Mobile and Locomotive Cranes

10.1.5 SAE J765-2017 Crane Stability Test Code

10.1.6 BSEE SA-332 – Crane Hazards Identified by BSEE in Risk Based Inspections

10.1.7 GEL HSSE Forms

a. CH-100 – Crane Pre-Use Inspection Form
b. CH-101 – Monthly Crane Inspection Form
c. CH-102 – Monthly Wire Rope Sling/Rigging Inspection Form
d. CH-103 – Critical Lift Checklist Form
e. CH-104 – Personnel Work Basket/Platform Hoisting Form

10.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
	ALL	Complete revision of procedure. Supersedes all requirements identified in HSSE_05.2 Hoisting Slings
04/10/2023	3.6 Throughout 4.3.1 4.3.2(b) 5.1.1 5.1.1 5.1.2 (a) 5.1.4 5.1.16 5.1.16(Caution)	New definition: personnel transfer basket Personnel work platform is now called personnel work basket / platform. Add: Responsible for providing signals to the crane operator. Must wear high visibility vest. Removed: and boom deflection from hoisting load. Removed: Onshore operations will utilize CH-105-Onshore Lift Plan for all lifts. Add: When the weight of the load is not readily available, the weight will be calculated in the field, or if additional support is needed, the PIC will contact Operations Management and Engineering. Remove: and with facility/area manager approval Add: establish communications (visual, radio, etc.) and/or designate a Relay Signal Person Add: crane operations during helicopter operations New Caution: Override of any safety system requires supervisor approval.

04/10/2023	5.2.1	Add: with the exception of pedestal cranes.
	5.2.14	Add: with the exception of offshore crane hoists in accordance with API requirements. (a) Offshore crane hoists will be inspected and documented in accordance with API RP 2D latest edition requirements.
	5.3.1 (a)	Remove: “soft line”
	5.3.1 (c)	Add: in working order
	5.3.2 (a)	Add: Taglines must be in good condition and visually inspected prior to use.
	5.3.3 (c)	Replace reference to appendix A with picture of sling angle examples.
	5.3.3 (g)	Add: wire rope sling storage requirements.
	5.3.4 (a)	Add: synthetic-web slings/straps inspection requirements
	5.3.4 (b) (ix)	Add: synthetic-web slings/straps will be removed from service after one year of service.
	5.3.4 (d)	Add: synthetic-web slings/straps storage requirements
	5.3.4 (e)	Add: The date the Synthetic-web sling/straps is placed in service will be documented on CH-102 to track the one year of service life.
	5.3.5 (b)	Remove: It can also be side loaded at a reduced working load limit.
	5.3.5 (d)	Removed: never replace the shackle pin with a bolt.
	5.3.5 (warning)	New warning: utilizing improperly fitted screw pins or replacing the shackle pin with a bolt may lead to catastrophic failure, injury or death.
	5.3.8 (a)	(a) Refer to site specific procedures for dock operations.
	5.3.8 (b)	(b) If there is any question about the safety of the lift, utilize the Stop Work Authority process to resolve the issue and obtain authorization to continue with the lift.
	5.3.8 (e)	Add: Rigging shall not be applied directly to a pallet.
	5.3.8 (k)	Remove: Boat lifts shall be made over the water whenever possible.
	5.3.8 (caution)	New caution: To aid in preventing incidents while backloading equipment offshore, ensure there is adequate space for backloading and landing equipment or personnel on vessel decks. Weather and sea conditions and safety of vessel personnel should also be considered in the lift planning.
	5.4	New: wire rope and pendant line replacement guidance

	5.5	Replace: Crane Suspended Personnel Platforms, with: Hoisting personnel in a work basket/platform
	5.5 (caution)	New caution: personnel lifts will not be conducted on derated cranes.
	5.5.13	Remove: The personnel platform is capable of supporting without failure its own weight and at least five (5) times the maximum intended load.
	5.5.16	Remove: The trail life raises the personnel platform to each location at which the personnel platform is to be hoisted and positioned for work. Add: A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift-weight (may utilize proof test weight) must be made from ground level, or any other location where employees will enter the platform, to each location at which the platform is to be hoisted and positioned.
	5.6	Add: personnel transfer basket requirements
	5.7.1 (a)	Add: fixed cranes
	5.7.1 (b)	Add: Mobile Cranes: While on outriggers, the lift is equal to 85% of the load/tipping capacity based on a critical lift assessment.
	5.7.1 (c)	Remove: with capability to rupture or breach equipment if dropped
	5.7.1 (f)	Add: Hoisting/Lifting equipment used outside of its normal design and/or operating capacity.
	5.7.1 (h)	Remove: Multiple crane operations requires a competent person to be onsite to direct lifting operations.
	5.9.2 (a)	Add: An approval by electronic signature or hand signature on CH-103 is acceptable.
	6.0	Add: All offshore cranes will be inspected to heavy use guidelines except for those cranes that are used less than 10 hours per month (infrequent usage) based on the average usage per quarter.
	6.1.1	Add: Two individuals
	6.5	Add: Infrequent usage offshore cranes minimum inspection requirements: Pre-use Monthly, and Annual.
	6.7.1, 6.7.2, 6.7.3	Change inspection retention to 4 years. (Previously 24 months)
	6.10.1	Add: and shall not be used to perform personnel lifts.
	8.1.3	Add: The lift will be considered critical when the load

	9.6	is equal to 85% the load/tipping capacity while on outriggers based on a critical lift assessment. Remove: if operator is unable to see the elevated warning line,
02/28/2024	5.3.1 a. 6.0	Add: All lifting and rigging materials must have manufacturer and rated capacity clearly embossed, and should be accompanied by certification documentation. Approved manufacturers of lifting and rigging materials include: USA, Canada, Western Europe, Japan, South Korea, and Taiwan. Change inspection criteria to: All offshore cranes will be inspected per Craine & Hoist manufacturer guidelines based on the average usage hours per quarter for that platform crane.

Appendix A. Rigging Specifications and Information

Rigging Specifications and Information

Good and Bad Rigging Practices

Use of Chokers

Bad – Because of cutting action of eye splice on running line.

Bad – Bolt on running line can work loose.

Good

Good

No cutting action on running lines.

Eye Fittings

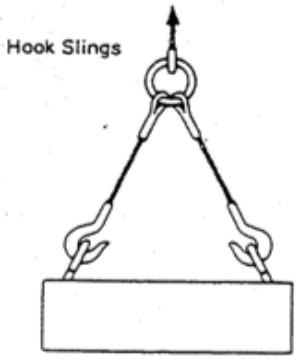
Bad Practice
Wire rope knot with clip. Efficiency 50% or less.

Bad Practice
Thimble should be used to increase strength of eye, reduce wear on rope and obtain maximum efficiency of attachment.

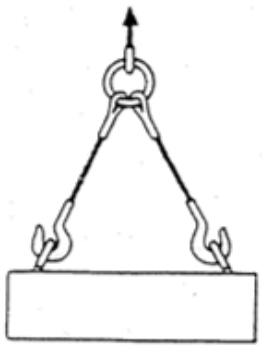
Good Practice
Note use of thimble in eye splice.

Good Practice
Use of thimble eye.

Hook Slings

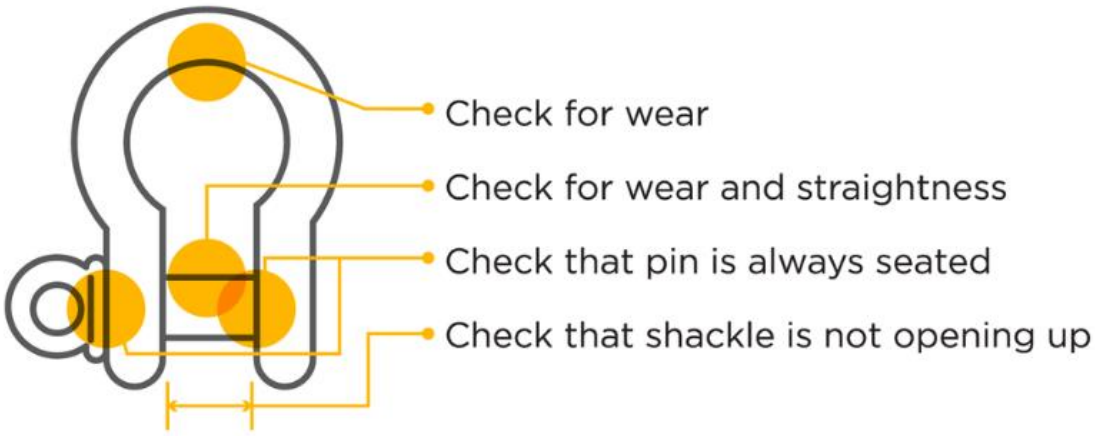


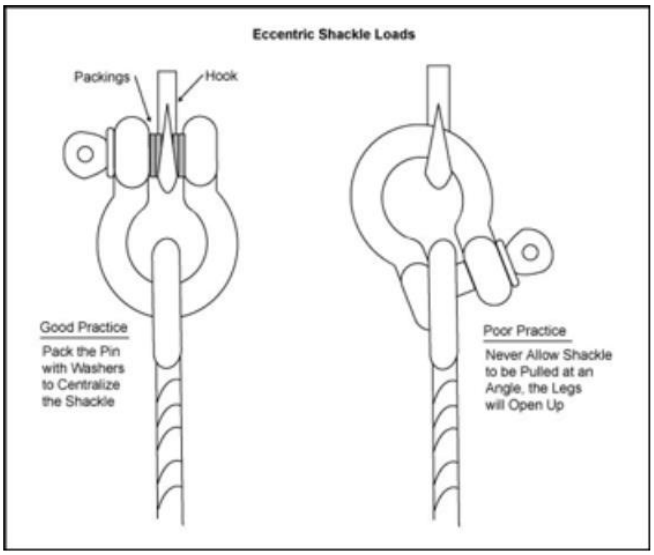
Bad Practice
Hook openings should be turned out.



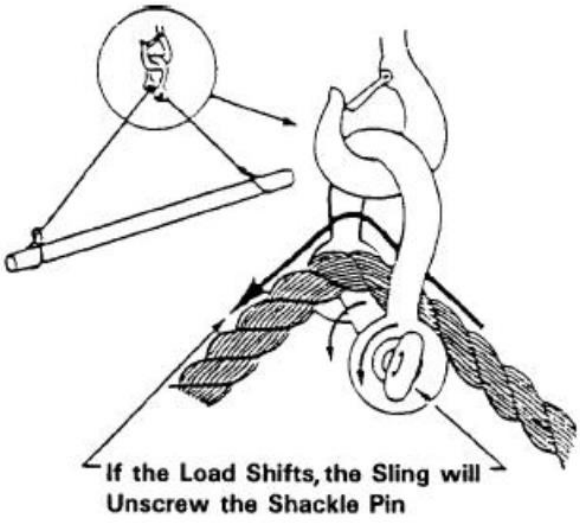
Good Practice
Hooks are turned out.

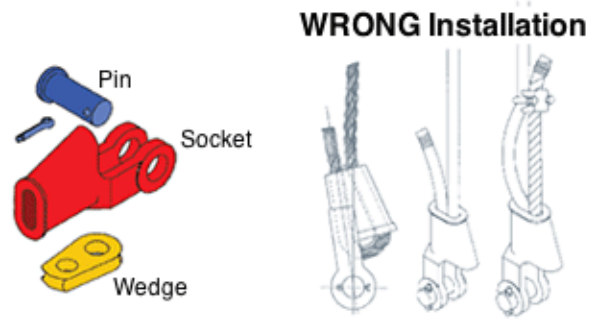
Appendix B.

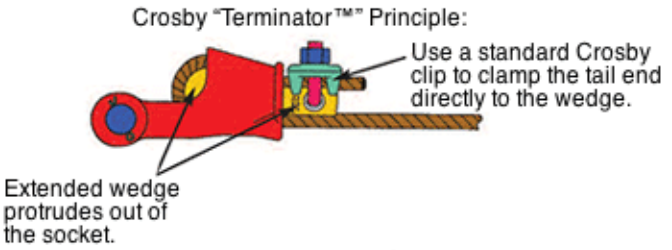




Bad Practice

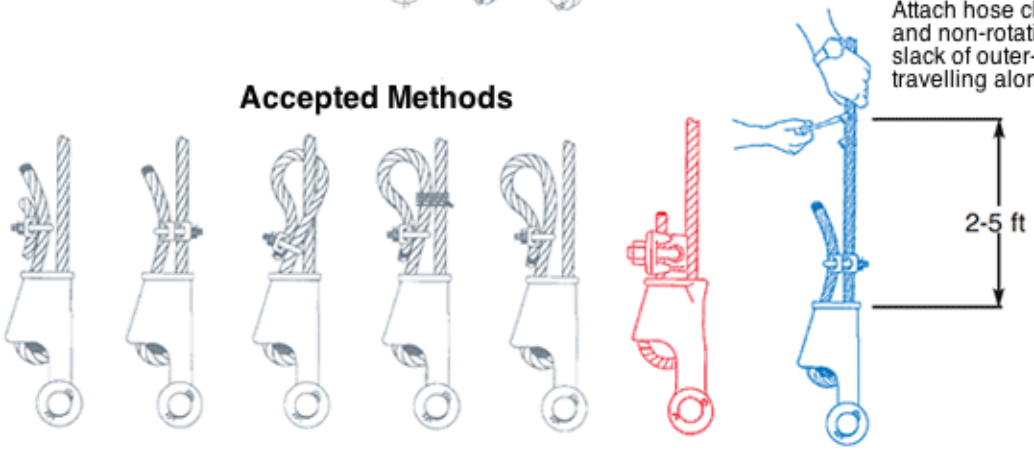




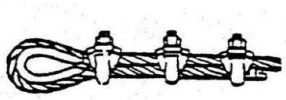
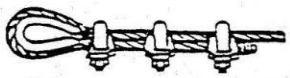
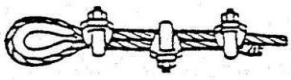


Non-Rotating Ropes

Attach hose clamp to all rotation-resistant and non-rotating wire rope to prevent any slack of outer- or inner strands from travelling along the entire rope length.



Proper U-Bolt Usage			
The U-Bolts of all clips should always be on the short (dead) end of the rope. Tighten nuts evenly to manufacturers' recommended torque. Before lifting, be sure that all clips have been torqued. After several lifts, retorque all clips.			
Number and Spacing of U-Bolt Wire Rope Clips			
Improved plow steel, rope diameter inches	**Number of clips**		**Minimum Spacing (inches)**
	Drop Forged	**Other Material**	
½	3	4	3
5/8	3	4	3 ¾
¾	4	5	4 ½
7/8	4	5	5 ¼
1	5	6	6
1 1/8	6	6	6 ¾
1 ¼	6	7	7 ½
1 3/8	7	7	8 ¼
1 ½	7	8	9

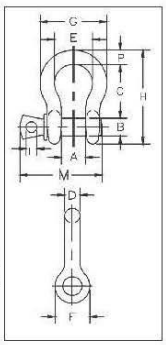
RIGHT METHOD	
	
Correct Method: U-Bolts of Clips on short end of rope.	Correct Method (with clips removed): No distortion on live end of rope.
WRONG METHOD	
	
Wrong: U-Bolts on live end of rope.	Wrong: Note mased spots on live end of rope.
	
Wrong: Staggered clips; two correct and one wrong.	Wrong: Note mashed spot due to U-Bolt of center clip.

SHACKLES

Crosby

G-209A
Grade 8

- Forged alloy steel, Quenched & Tempered, with alloy pins.
- Meets performance requirements of Grade 8 shackles.
- Working Load Limit permanently shown on every shackle.
- Hot-dip galvanized.
- Size 3/8 inch is mechanically galvanized.
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Charges for proof testing and certification available when requested at the time of order.
- Approved for use at -40° C (-40° F) to 204° C (400° F).
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these shackles meet other critical performance requirements including impact properties and material traceability, not addressed by ASME B30.26.
- G-209A Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271G, Type IVA, Grade B, Class 2, except for those provisions required of the contractor.



G-209A Alloy Screw Anchor Pin Shackles

Load Rated · QUIC-CHECK · QT · CE · APPLICATION AND WARNING INFORMATION SECTION 17

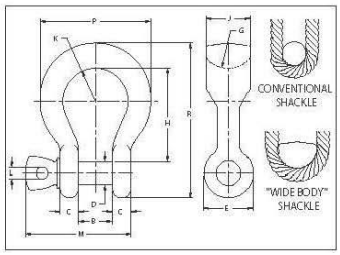
Nominal Size (in)	Working Load Limit (t)	Stock No.	Weight Each (lb)	Dimensions (in) A	B	C	D	E	F	G	H	L	M	P	Tolerance (+/ - in) C	A
3/8	2	1017450	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.03	.38	.13	.06
7/16	2.67	1017472	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.38	.44	.13	.06
1/2	3.33	1017494	.63	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	5	1017516	1.38	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	7	1017538	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	9.5	1017560	3.61	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	12.5	1017582	5.32	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.07	1.06	.25	.06
1-1/8	15	1017604	7.25	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.59	1.25	.25	.06
1-1/4	18	1017626	9.88	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.16	1.38	.25	.06
1-3/8	21	1017648	13.25	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.84	1.50	.25	.13

4.5:1 Design Factor. Maximum Proof Load is 2 times the Working Load Limit (metric tons) and 2.2 times the Working Load Limit (short tons).
For Working Load Limit reduction due to side loading applications, see Warnings & Applications.

G-2169

S-2169

- Quenched & Tempered for maximum strength.
- Forged alloy steel.
- Available in galvanized (G) and self colored (S) finish.
- Individually proof tested and magnetic particle inspected. Crosby certification available at time of order.
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these shackles meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Look for the Red Pin®... the mark of genuine Crosby quality.



G-2169 / S-2169 Alloy Screw Pin Wide Body Shackles

Load Rated · QT · APPLICATION AND WARNING INFORMATION SECTION 17

Working Load Limit (t)	G-2169 Stock No.	S-2169 Stock No.	Weight Each (lb)	Dimensions (in) B +/- .25	C	D +/- .02	E	G	H	J	K	L	M	P	R
7	1021655	1021664	3.5	1.25	.69	.88	1.82	1.25	3.56	1.60	1.25	.50	3.97	4.10	5.87
12.5	1021673	1021682	8.8	1.69	.92	1.13	2.38	1.37	4.63	2.13	1.63	.56	5.13	5.51	7.63
18	1021691	1021699	13	2.03	1.16	1.38	2.69	1.50	5.81	2.50	2.00	.69	6.25	6.76	9.38

5:1 Design Factor. Proof Load is 2 times the Working Load Limit.

Copyright © 2022 The Crosby Group LLC All Rights Reserved

CROSBY® CLIPS WARNINGS AND APPLICATION INSTRUCTIONS

G-450 (Red-U-Bolt®)

SS-450 (316 Stainless Steel)

⚠ WARNING

- **Failure to read, understand, and follow these instructions may cause death or serious injury.**
- **Read and understand these instructions before using clips.**
- **Match the same size clip to the same size wire rope.**
- **Prepare wire rope end termination only as instructed.**
- **Do not use with plastic coated wire rope.**
- **Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque (See Table 1).**

Efficiency ratings for wire rope end terminations are based upon the minimum breaking force of wire rope. The efficiency rating of a properly prepared loop or thimble-eye termination for clip sizes 1/8" through 7/8" is 80%, and for sizes 1" through 3-1/2" is 90%.

The number of clips shown (see Table 1) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 36 Class, FC or IWRC; IPS or XIP, XXIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 1 inch and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation-resistant RRL wire rope, 8 x 19 Class, IPS, XIP, XXIP sizes 1-1/2 inch and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, XXIP sizes 1-3/4 inch and smaller.

For other classes of wire rope not mentioned above, we recommend contacting Crosby Engineering to ensure the desired efficiency rating.

For elevator, personnel hoist, and scaffold applications, refer to ANSI A17.1 and ANSI A10.4. These standards do not recommend U-Bolt style wire rope clip terminations. The style wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1. Refer to Table 1 in following these instructions. Turn back specified amount of rope from thimble or loop.

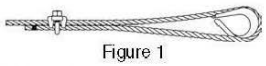


Figure 1

Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope – live end rests in saddle (Never saddle a dead horse!). Use torque wrench to tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque. (See Figure 1)

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Use torque wrench to tighten

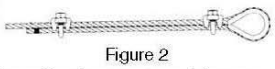


Figure 2

nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. (See Figure 2)

3. When three or more clips are required, space additional clips equally between first two – take

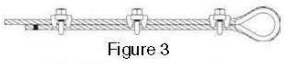


Figure 3

up rope slack – use torque wrench to tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque. (See Figure 3)

4. If a pulley (sheave) is used in place of a thimble, add one additional clip. Clip spacing should be as shown. (See Figure 4)

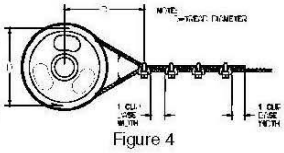


Figure 4

5. WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles using the recommended number of clips on each eye (See Figure 5).

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.

Figure 5

Figure 6

6. IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and use torque wrench to retighten nuts to recommended torque. In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size (in.)	Rope Size (in.)	Minimum No. of Clips	Amount of Rope to Turn Back in Inches	*Torque in Ft.Lbs.
1/8	1/8	2	3-1/4	4.5
3/16	3/16	2	3-3/4	7.5
1/4	1/4	2	4-3/4	15
5/16	5/16	2	5-1/4	30
3/8	3/8	2	6-1/2	45
7/16	7/16	2	7	65
1/2	1/2	3	11-1/2	65
9/16	9/16	3	12	95
5/8	5/8	3	12	95
3/4	3/4	4	18	130
7/8	7/8	4	19	225
1	1	5	26	225
1-1/8	1-1/8	6	34	225
1-1/4	1-1/4	7	44	360
1-3/8	1-3/8	7	44	360
1-1/2	1-1/2	8	54	360
1-5/8	1-5/8	8	58	430
1-3/4	1-3/4	8	61	590
2	2	8	71	750
2-1/4	2-1/4	8	73	750
2-1/2	2-1/2	9	84	750
2-3/4	2-3/4	10	100	750
3	3	10	106	1200
3-1/2	3-1/2	12	149	1200
If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.				
If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.				
*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.				

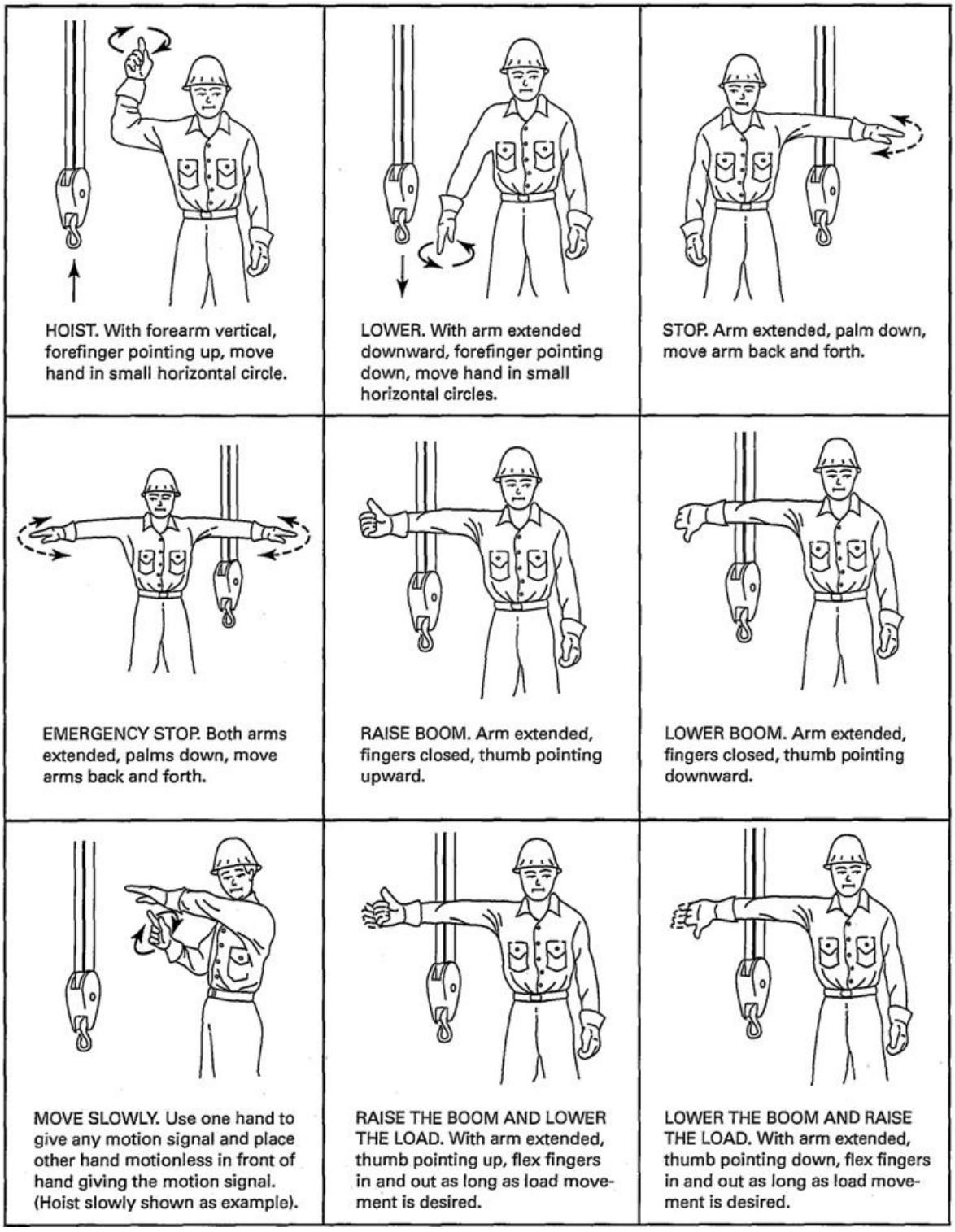
Copyright © 2013 The Crosby Group LLC
All Rights Reserved

Preferred Shackles

Screw Pin Anchor Style Shackle – these shackles are to be used when lifting and placing a load. The pin shall be tightened prior to each lift. The screw pin shackle is capable of being used at full working loads to gather multiple leg slings. It can also be side loaded at a reduced working load limit.

Bolt Type Anchor Style Shackle – these shackles are to be used in permanent or long-term installations. The proper nut and cotter pin or stainless steel keeper rings shall be used at all times with this type of shackle. The bolt pin shackle is capable of being used at full working loads to gather multiple leg slings. It can also be side loaded at a reduced working load limit.

Appendix C. Standard Hand Signals



HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.

LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.

STOP. Arm extended, palm down, move arm back and forth.

EMERGENCY STOP. Both arms extended, palms down, move arms back and forth.

RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.

LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.

MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example).

RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

Appendix D. Vessel Loading/Unloading Utilizing Cranes (Mobile/Pedestal) Guidelines

- Cranes are used to support hoses during the loading/unloading of vessels such that it allows the hoses to clear the dock structure as the vessel changes elevation during the process as well as minimizes the potential for hoses to become damaged/trapped between the dock structure and vessel. The crane/hoses are connected during the entire loading/unloading of vessels.
- The hose is attached to a fixed connection on the vessel and the facility during the loading/unloading of vessels.
- Transfer hoses are long enough to allow the vessel to move to the limits of its moorings without placing strain on the horse or transfer piping system.
- Each hose is supported to prevent kinking or other damage to the hose and strain on its coupling.
- Crane supported suspended hoses are used when conventional means to support the hoses during the loading/unloading process are more hazardous or cannot be used because of marine structural obstacles and the higher probability to damage hoses.
- When hoses are supported with the crane, the crane will be locked out and the crane operator will remain in the immediate area.
- The area immediately within the fall zone at the dock will be barricaded off to prevent walking under the crane supported base.
- Each terminal that suspends hoses by crane is required to have a crane standard operational procedure that is unique to that site’s vessel loading/unloading process that addresses the operation and crane lock out in detail.

05.4P-Ladders

1.0 Scope

This procedure applies to all Genesis Energy, L.P. (GEL) employees and contractors using ladders on property leased, owned or operated by GEL.

2.0 Purpose

- To provide employees with information on the proper use, selection, inspection and maintenance of ladders.

3.0 Procedures

All ladders utilized will be a minimum of Type 1A rated for 300 lbs. If work from a ladder is long term in nature or requires heavy physical exertion, other methods such as scaffolds or personnel lifts shall be used.

3.1 Proper Selection

Not every ladder is right for every use. Be aware of a ladder's weight and height limits. Never use metal or aluminum ladders on or near electrical sources.

3.2 General Ladder Safety

3.2.1 Fall protection will be utilized when working 4 feet to the heel or more above the nearest work surface, except when in accordance with Section 3.9 – Working from a Ladder.

3.2.2 Wood ladders are prohibited.

3.2.3 Ladders shall not be loaded in excess of the safe capacity for which it is constructed. Long ladders shall be braced to prevent deflection.

3.2.4 Place ladders on level ground and safety support footing where there is soft ground.

3.2.5 Keep steps and rungs free of grease, oil, paint or other slippery substances.

3.2.6 Hands and shoes should be clean and free from slippery substances when climbing a ladder.

3.2.7 Do not allow makeshift repairs.

3.2.8 Replace frayed or badly worn rope promptly.

3.2.9 The lashing of ladders together to increase the length of the ladder is prohibited.

3.2.10 Ladders should not be placed on boxes, barrels or other unstable bases to obtain additional height.

3.2.11 Never use ladders in a horizontal position.

3.2.12 Never place ladders in front of doors or openings unless appropriate precautions are taken (the door is locked, barricaded or a person is positioned to guard against an unexpected opening).

3.2.13 Do not use step ladders on scaffolds.

3.3 Metal Ladder Safety

3.3.1 Metal ladders shall be marked with “Caution – Do Not use Around Electrical Equipment.”

3.3.2 Metal/Aluminum ladders shall not be used within 10 feet of open electrical apparatus, wiring or other live electrical equipment.

3.3.3 Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

3.3.4 Never straighten or use a bent metal ladder.

3.4 Ladder Inspections

3.4.1 Inspect ladders carefully on receipt, prior to each use and document annually on LAD-100-Ladder Inspection Form.

3.4.2 Ladders found to be damaged, defective or with missing parts should be removed from service, marked “DO NOT USE” and discarded.

3.4.3 All ladders, regardless of type, should be inspected for the following:

- Steps and rungs are all in place, intact, free from grease or oil and have slip-resistant surfaces.
- All braces, brackets, bolts and screws are in place and tight.
- Ropes are not frayed, worn or missing.
- Spreaders and locking devices are functioning properly.
- Safety feet are in place.
- Metal parts are lubricated.
- Splinters and sharp edges are removed.
- Warning labels are in place.
- Rails are not cracked or broken.

3.5 Ladder Storage

3.5.1 Ladders will be stored in one of the following ways:

- Stored vertically and secured with a bungee cord, chain or other mechanical device.
- Stored horizontally from two or more hanger type devices.

3.5.2 Ladders will be stored where they will not be exposed to the weather and where there is good ventilation.

3.5.3 Ladders will not be stored in a manner that will block emergency exits or routine walking paths.

3.6 Ascending/Descending a Ladder

3.6.1 While ascending/descending a ladder, always face the ladder and maintain at least a 3-point contact: 2 feet and 1 hand or 2 hands and 1 foot on the ladder.

3.6.2 Never carry items in your hands. Carry tools or other materials in a belt or pocket, or raise and lower by rope, basket or sturdy sack.

3.6.3 Personnel, tools and equipment will not exceed 300 lbs.

3.7 Straight and Extension Ladders

3.7.1 Extension ladder sections must overlap at least 3’ for total extended lengths up to 33’; 4’ for total lengths 33’ to 44’. Install ladders so that the base section is closest to the structure.

3.7.2 Install ladders so that the horizontal distance of the ladder foot from the top support is ¼ of the working length of the ladder (4:1 horizontal ratio). The correct angle information can be found on the side of the ladder.

3.7.3 Always ensure that working lengths of ladder extend at least 3’ above a roof or other elevated platform and are properly secured.

3.7.4 Always ensure that both side rails are fully supported at the top and bottom.

3.7.5 Secure the ladder at the point of support to prevent movement by stabilizing the ladder at the bottom while another person climbs the ladder and secures the ladder at the top. If ladder cannot be secured at the top, outriggers or another person must stabilize the ladder while in use.

3.7.6 Ensure all locks are securely hooked over rungs before climbing.

3.7.7 Make adjustments of ladder heights only when standing at the base of the ladder.

3.7.8 Ladders must stand on a firm, level surface. Always use appropriate safety feet or non-slip bases.

3.7.9 Always place ladder close enough to work to avoid dangerous overreaching. Keep weight centered between rails. Don't work more than an arm's length away from the ladder.

3.7.10 Never stand on the top four rungs of straight or extension ladders.

3.8 Stepladders

3.8.1 Ensure stepladders are fully opened with spreader bars in the locked down position. Never use a stepladder as a straight ladder.

3.8.2 Access should be from 1 side of the stepladder unless designed for dual access.

3.8.3 Never stand on the top two steps of stepladder.

3.8.4 Never place tools on the top step of the stepladder.

3.9 Working from a Ladder

3.9.1 Light work from a ladder requiring two hands is permitted with the following requirements:

a. Maximum of 8 foot ladder allowed.

b. Keep two feet on the same step and the body (knees or chest) supported by the ladder to maintain three point of contact.

c. Ensure a safe handhold is available.

d. Work shall not exceed 30 minutes.

3.10 Fixed Ladders

3.10.1 Fixed ladders shall be provided with cages, wells, ladder safety devices or self-retracting lifelines where the length of climb equals or exceeds 24 feet.

3.10.2 Fixed ladders must be securely attached to the permanent structure and flooring.

3.10.3 Safety chains or bars on elevated platforms must be in good condition and must be used to isolate the ladder when the ladder is not in immediate use.

3.10.4 By November 18, 2036, all fixed ladders that extend more than 24 feet shall be equipped with a personal fall arrest system or a ladder safety system.

3.10.5 Fixed ladders on railcars and tanker trailers must be climbed with at least 3-points of contact. Refer to Site Specific procedures for fall protection procedures on railcars.

4.0 References

4.1 OSHA Standards

4.1.1 OSHA 29 CFR 1910.23 – Ladders

4.1.2 OSHA 29 CFR 1926.1053 - Ladders

4.2 Revisions

Date of Revision	Page(s)/Section(s) Revised	Revision Explanation
11/02/2020	All	Complete revision of Ladder Procedure and Form

06.7P-Smoking Policy

6.7 Smoking Policy

Purpose

Genesis Energy, LLC (GEL) has a responsibility to its employees to provide a safe and healthful work environment. Research indicates that smoking and the breathing of second hand smoke constitutes a significant health hazard to both smoker and non-smoker. In addition to direct health hazards, smoking contributes to increased costs in employee absenteeism, health care, medical insurance, and cleaning and maintenance to facilities.

Policy

In order to enhance a healthful work environment, it is the policy of GEL to prohibit smoking in all enclosed workplaces.

Scope

This procedure applies to all buildings, offices, and workspaces owned, leased, or operated by GEL.

Procedure

Smoking is prohibited in all enclosed workplaces and offices.

Site Managers shall designate permissible smoking areas outside of each affected office building.

Designated smoking areas shall

- Be at least 25 feet from any entrance or exit door that provides building access.
- Be kept clean and will be equipped with receptacles that safely contain debris generated from smoking.

Signs shall be posted on all entrances to buildings and office spaces indicating offices and buildings are smoke free.