



HEALTH, SAFETY & ENVIRONMENTAL HANDBOOK

**DTC ENERGY GROUP, INC.
2012 EDITION**

HEALTH, SAFETY & ENVIRONMENTAL HANDBOOK

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This handbook applies to all DTC Energy Group, Inc. personnel and will be referred to as the DTC Energy Group or DTC Health, Safety & Environmental (HSE) Handbook.

This handbook serves as a reference for *minimum* rules and standards at DTC Energy Group operations and facilities.

The guidance in this handbook is not all-inclusive.

Area and local management may adopt more stringent rules and standards to meet specific needs.

Contractor rules and standards must meet or exceed the requirements of this handbook as well as any related regulatory requirements.

Compiled and revised by Robert Sylar, CEO, Luke Clausen, COO and DTC Staff for DTC Energy Group, Inc. for use while training or operating at our sites and facilities. This manual was prepared to improve safety awareness and facilitate safety training.

“Leadership in safety through example”

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HSE SLOGAN

“SAFETY - WELL WORTH IT.”

HSE MISSION

- To promote a corporate attitude whereby ALL personnel embrace these Health, Safety and Environmental concepts as their personal responsibility and their standard of excellence.
- To foster a culture in which HSE concerns are equally important to all other business activities.
- To provide a technically sound, clear, and cost-effective HSE standard for the purpose of conducting activities in a healthy, safe and environmentally responsible manner.
- To improve HSE performance, while instilling the “Spirit of Compliance” in our personnel and associates.
- To provide the means to educate and train personnel as well as subcontractors on the jobsite.

HEALTH, SAFETY AND ENVIRONMENTAL POLICY

DTC Energy Group is committed to protecting people and the natural environment in all areas where it conducts business. Implementation of this policy is a management value and is the responsibility of every employee.

It is DTC Energy Group's policy to:

- Comply with all health, safety and environmental laws and regulations.
- Cooperate with local, state and federal agencies in their inspection and enforcement activities.
- Incorporate HSE considerations in the company's planning and operational decisions.
- Develop and communicate HSE objectives throughout the company so that all employees understand their individual responsibilities and are appropriately trained in carrying out these objectives.
- Manage operations in a responsible manner and respond effectively to avoid and/or mitigate adverse HSE impacts associated with operations.
- In the event of a safety or environmental incident, report information to governmental authorities concerning the situation so as to facilitate a prompt and appropriate response to potential public inquiries. Participate in the formulation of prudent and responsible HSE laws and regulations that impact operations.
- Foster constructive working relationships with health, safety and environmental organizations and agencies.
- Commit the resources needed to implement our HSE policy.

RESPONSIBILITIES

Management will:

- Promote the concept that HSE receives equal consideration with production and profits by including HSE metrics in annual employee performance reviews and operational goals.
- Strive to provide all employees with a work environment free from unsafe conditions.
- Require that all injuries, vehicle collisions, spills/environmental releases, near misses, fires and any other unsafe conditions be promptly reported to supervision and investigated as warranted.
- Accompany injured DTC Energy Group personnel to the doctor for treatment. If management is not available, a DTC Energy Group HSE designate shall accompany the injured DTC Energy Group personnel.
- Provide employees with the appropriate tools and training to successfully complete each job safely.
- Ensure all employees and contractors are qualified to perform assigned job duties.

- Communicate to all employees and contract employees the DTC HSE policies and procedures.
- Demonstrate the level of HSE excellence expected. Lead by example.
- Require the use of necessary personal protective equipment (PPE) by all employees.
- Resolve and discuss unsafe behaviors as soon as they are observed.
- Analyze HSE performance when evaluating service contracts.
- Require routine inspections and Job Safety Analysis (JSA) to evaluate and communicate potentially unsafe conditions prior to project commencement.
- Conduct and/or assign and document periodic safety meetings.

Employee will:

- Evaluate all activities before undertaking to ensure that the operation will be safe and effective.
- Demonstrate responsibility by actively caring for the safety of fellow workers and the general public.
- Stop any task/job immediately if observing an unsafe act being performed or any unsafe condition developing. There will be no retribution for any work stoppage that occurs due to HSE concerns.
- Report all injuries, vehicle collisions, spills/environmental releases, near misses, fires or unsafe conditions to your supervisor immediately.
- Actively coordinate and participate in regularly scheduled safety meetings and training classes appropriate to the business unit and job description.
- Share your concerns for your personal safety or lack of prior training.
- Wear the required PPE according to the job description and/or task.
- Assist in incident investigations.
- Conduct Behavioral Safety Observations or Job Safety Analyses.
- Discuss any observed unsafe condition, behavior and/or practice with fellow workers and your supervisor.
- Understand and comply with all HSE rules and policies that are applicable to the location and task.
- Follow Standard Operating Procedures (SOP's) and Job Safety Analyses (JSA's) to complete each task.
- Advise your supervisor of all prescription medication(s) and over-the-counter medications that may adversely affect your ability to do your job safely.
- Learn the location of all emergency equipment on the site and be familiar with its purpose and usefulness.
- Become familiar with all emergency response signals and plans.

Contractor will:

- Evaluate all activities before undertaking to ensure that the operation will be safe and effective.
- Stop any task/job immediately if an unsafe act or condition is observed. There will be no retribution for any work stoppage that occurs due to HSE concerns.
- Be familiar with the respective company's and/or DTC Energy Group's HSE requirements before starting any project on DTC facilities. Discuss the differences and special requirements of the various programs.
- Be responsible for the actions of employees by requiring them to be trained and follow the rules that are applicable to the job and location.
- Immediately report all injuries, vehicle collisions, spills/environmental releases, near misses, fires and unsafe conditions to the DTC Energy Group Supervisor.
- Hold pre-job safety meetings to discuss the project and anticipate HSE issues. Additionally, regular safety meetings will be conducted to review the project's progress and HSE issues.
- Actively participate in crew pre-job safety meetings and review of Job Safety Analysis (JSA) noting hazards specific to working with third party equipment and personnel.
- Provide proof of training or other HSE documentation upon request.
- Conduct and document incident investigations and implement corrective measures.
- Participate in HSE reviews.
- Gain approval and/or appropriate training before operating equipment.
- Ensure equipment is maintained in a safe working condition and properly rigged prior to the start of any operation.

- Provide MSDS's for all chemicals brought to any work site to the DTC Supervisor.
- Clean-up work areas upon completion of job. Dispose of garbage in an environmentally sound manner.

SAFETY RULES

- DTC Energy Group will enforce compliance of HSE policies and practices.
- Report all injuries, vehicle collisions, spills/environmental releases, near misses, fires, unsafe conditions and unsafe work practices to management.
- Hold a pre-job safety meeting to review procedures, equipment locations and emergency plans. Ensure all required PPE and safety and emergency equipment is readily accessible for the project.
- Seat belts are required for all occupants during the operation of any vehicle used for Company business. It is the driver's responsibility to require that everyone fastens their seat belt before moving the vehicle.
- Use handrails when ascending or descending stairways.
- Operation of equipment having a "DANGER – DO NOT OPERATE" or similar warning tag is prohibited.
- Under normal operations, all operating machinery and electrical switchgear is required to have all safety guards, switches and alarms in place and functional. Lockout-Tagout controls are required if safeguards are to be bypassed in accordance with the DTC-Energy Isolation Program.
- All isolation valves upstream of pressure relief valves must be locked or sealed open.
- Finger rings, loose clothing, unsecured long hair (below collar), watches and other loose accessories shall not be worn while operating electrical equipment, while climbing ladders or when within an arm's length of rotating machinery .
- Always use proper tools and equipment for the job. Do not use damaged or incorrect tools to perform the task. Damaged tools are to be replaced, repaired or discarded.
- Erect barricades, flags or barricade tape around areas of hazardous work, holes, floor openings, overhead work zones and exposed energized circuits. Overhead protection may also be utilized when applicable. Excavations must be flagged, fenced or secured when left unattended.
- Fire extinguishers, eyewash stations and self-contained breathing apparatuses should be inspected monthly or as required. Alarm boxes, fire doors, First Aid kits and all other emergency equipment must be well maintained and readily accessible.
- Smoking on Company premises is restricted to designated areas only. Smoking is not permitted in any building or enclosed structure intended for personnel occupancy.
- No smoking within 150 feet of any well, wellhead, tank battery, oil transfer pump, production facility or other area where combustible, flammable vapors or liquids could reasonably exist.
- Do not walk or stand on storage tanks or piping unless they are equipped with properly designed walkways and fall protection barriers. Never jump from one to the other!
- Never stand in the "Line of Fire" when opening potentially pressured equipment such as pig launchers/receivers, bull plugs, valves, presses, etc.
- Non-intrinsically safe electrical equipment such as cell phones, pagers, cameras and laptop computers, etc., are not to be brought into Class I Division II areas (As defined by the National Electric Code) unless cleared by the Hot Work Permitting process.
- Do not use an air hose to blow particles off of clothing, hair or skin.
- Personnel and contractors will follow applicable sections of the Manual for Uniform Traffic Control Devices (MUTCD) to protect both workers and the public when DTC activities impact traffic flow on public roads.

DRUG, ALCOHOL AND FIREARM POLICY

It is the employee's responsibility to be familiar and comply with the Drug, Alcohol and Firearm Policy specific to the individual's respective assignment.

This policy is the *minimum* standard for all employees, contractors and vendors working for DTC Energy Group.

- Work-related consumption of alcohol or illegal drugs is prohibited! Therefore the use, possession, concealment, sale, transportation, promotion, purchase, distribution, or testing positive for alcohol or drugs while working on Company premises, or in Company or hired vehicles, is prohibited and subjects the employee in violation to discharge.
- As a condition of YOUR employment, each employee has the responsibility to be knowledgeable of the Drug, Alcohol and Firearm Policy and to fully comply with the provisions of the plan. The Company may require an employee to take a test to determine the presence of drugs or alcohol. An employee's refusal to submit to such a test is considered a presumption that the employee would have tested positive.
- An employee indicted for a criminal drug or alcohol offense must notify the Company of that fact within five days of the incident. A conviction from the court must be reported immediately and will result in disciplinary action up to and including discharge. Failure to report incidents will result in similar action.
- Employees taking prescription medications or over-the-counter medications will inform their supervisor of this fact and of any side effects or warnings associated with taking the medication(s). These side effects may result in the employee being relieved of their duties until they have completed taking the medication.
- Prescriptions must be in the name of the employee possessing the medication. Otherwise this will result in disciplinary action up to and including discharge. Prescriptions are not to be shared at the work place.
- Personnel found possessing any firearms, weapons, ammunition, drugs, or alcohol on company property will be subject to being removed from the job site, and face disciplinary action up and including discharge.
- Personnel emitting a strong odor of alcohol will be assumed to be intoxicated, dismissed immediately and will have provided DTC grounds for breath and other testing.
- The Company may conduct searches and inspections for unauthorized items for any reason at any time.

PERSONAL PROTECTIVE EQUIPMENT

The following rules identify required personal protective equipment for ALL personnel including contractors. Loaner equipment may be provided for visitors at the location. The DTC onsite job representative should be consulted in advance to determine need and availability.

Additional information can be found in 29 CFR 1910.132 Subpart I.

General Guidelines

- DTC Energy Group will provide non-prescription safety glasses, hardhats, and hearing protection to DTC employees. DTC will provide FRC apparel as required by client's contract and OSHA regulation.
- All personal protective equipment (PPE) must meet applicable standards established by recognized governmental and/or industry groups.

- Personnel handling chemicals or other agents must wear proper eye or face protection, respiratory protection, gloves and aprons. Employees are responsible for the proper use, cleaning and storage of their assigned PPE.
- Rubber gloves, rubber apron and chemical goggles will be worn when handling chemicals or hazardous materials such as acids, caustic soda and soda ash. Adequate training is required prior to handling these materials.

Head Protection

(29 CFR 1910.135 and MSHA Part 56.15002)

- Approved hardhats are to be worn in field operations and other designated areas.
- Newly acquired hardhats shall meet the minimum requirements set forth by ANSI Z89.1 1997 (Type 1 or 2 – Class E Hardhats).
- No modifications or alterations of the shell or support harness are permitted. Hardhats must be worn as designed, specifically bill forward and level. No ball caps, hoods or similar head covering under the suspension will be allowed. Winter linings are approved and should be installed so as not to interfere with the suspension as designed.
- Hardhats will not be painted. Name, title and appropriate safety stickers are allowed.

Eye Protection

(29 CFR 1910.133 and MSHA Part 56.15004)

- Safety eyewear must meet or exceed ANSI Z87.1 and be worn during field operations or as designated.
- ANSI approved eyewear is to be worn over non-ANSI approved eyewear or those not having side shields.
- Avoid the use of contact lenses while working with chemicals. If contact lenses are worn, special precautions such as wearing goggles must be taken.
- Dark-tinted glasses specifically designed for cutting will be worn by the welder at all times when using an oxygen-acetylene torch.
- Dark-shaded safety glasses are not an acceptable alternative.
- Welding helmets fitted with #10 filtered lenses will be worn by the welder. The welder's fire-watch or work assistant will wear welders #5 filtered cutting lenses at all times when electric arc welding.
- Splash-proof chemical goggles will be worn when handling hazardous chemicals liquids or powders, or when exposed to chemical fumes. Examples include: cleaning with chemical solutions or solvents, or while handling or mixing chemicals.

Face Shields

(29 CFR 1910.133 and MSHA Part 56.15014)



- Face Shields will be worn over safety glasses any time there is exposure or flying debris or splashing particles. Examples:
 - Changing tong dies
 - Hammering on high-tensile steel (like chain links)
 - Using bench grinders or portable disk grinders
 - Chipping, filing, buffing
 - Spraying with a high-pressure paint or water gun
- Although face shield fogging is a known problem, employees are expected to stop the activity, clean the face-shield and then continue on with the activity. Fogging does not relieve the employee of the responsibility for wearing the full face shield when appropriate.

Hearing Protection

(29 CFR 1910.95 and MSHA Part 62.160)

- Hearing protection must be worn in designated high-noise areas. (85 dBA or higher).
- If the high-noise area is determined to be 115 dBA or higher, dual protection (inserts and muffs) shall be worn.

Hand Protection

(29 CFR 1910.138 and MSHA Parts 56.15006 and 15007)

- Personnel must wear hand protection appropriate for the task when performing work that may cause injury to the hands. An example would be wearing rubber gloves when handling caustic soda, acids, soda ash and lime.
- Electrical lineman's gloves are to be worn when working on energized electrical equipment that exposes the employee to voltages greater than 50 VAC, except during diagnostic testing.
- Gloves will be replaced or tested every six months as required. Wearers of the lineman's gloves are to test for holes or leaks before each use. Defective or damaged gloves must not be used. Any glove found defective or damaged should be destroyed and replaced immediately.
- No rings, jewelry or other personal accessories, including wrist bands, may be worn while working around electrical equipment or rotating machinery such as a drilling rig.

Foot Protection

(29 CFR 1910.136 and MSHA Part 56.15003)

- Protective footwear is required to be worn in field operations and other designated areas.
- Management may dictate the need for special requirements (i.e. defined heel, leather, canvas, etc.).
- The protective footwear must meet or exceed ANSI Z41.1 (compression and impact ratings).
- Foot protection should cover the ankles. This negates the use of steel (hard) toed tennis shoes.

Clothing

(29 CFR 1910.132 and MSHA Part 56.15007)

- Clothing will not be torn, baggy or ragged such that it may catch on machinery or create unnecessary exposure to the employee's torso, arms or legs.
- FRC clothing must have a minimum of 4-inch sleeve covering the shoulder. The wearing of tank tops, sleeveless shirts or wearing of overalls with no shirts is prohibited.
- Pants will be full-length and made of sturdy material such as cotton.
- Pants will not be tucked inside of work boots while handling chemicals, mud mixing or welding activities.
- Short pants are prohibited unless authorized by management.
- Clothing should be washed frequently. Oil-saturated clothing irritates the skin and constitutes a fire hazard.
- Flame retardant clothing (FRC) will be required for all personnel working on DTC field locations where experience and or hazard assessment has identified a risk of "Flash Fire". FRC is not intended to be used in place of administration, engineering and work practice controls, but to provide an added margin of protection. DTC's FRC requirements are available from our HR Representative and are based on OSHA's .

Respiratory Protection

(29 CFR 1910.134 and MSHA Part 56.15005)

DTC Energy Group has adopted this written Respiratory Protection Policy. Respiratory protection will be provided to all employees based on hazard exposure. Any employee identified as needing respiratory protection for job responsibilities must have an annual fitness test and medical evaluation and/or questionnaire reviewed by a physician.

- Respirators must be regularly cleaned and disinfected after each use and stored in a sanitary container when not in use.
- Dust masks are NOT permitted as respiratory protection. Dust masks are not a suitable replacement for air-purifying, half-face respirators.
- Dual cartridge respirators will be worn whenever spray-painting or by anyone working or exposed to atmospheres contaminated with harmful dusts, mists, smokes, sprays or vapors.

- Self-Contained Breathing Apparatus (SCBA's) will be used for entering areas contaminated with toxic gases or atmospheres that are oxygen deficient.

Note: The Confined Space Entry process must be followed prior to entry.

- Air supplying respirator hoods will be used while sandblasting.
- All personnel wearing a respirator must be clean-shaven in the seal area of the respirator to ensure a proper fit and seal.

OFFICE SAFETY

In addition to other procedures/precautions in this manual, the following safety precautions should be followed when working in an office environment. There may be other site specific procedures or requirements so check with Facility Operations Management or the Building Manager as well.

Precautions

- Each employee shall be familiar with the location of the fire alarm pull station nearest their workstation.
- Each employee must become familiar with the appropriate evacuation route for their workstation. Evacuation routes for each floor and building area are clearly marked in prominent locations.
- During fire alarms, designated Fire Wardens should make last-minute searches of their assigned areas to ensure all personnel are evacuated. Employees are expected to help the Fire Wardens by clearing the area quickly. **If a Fire Warden requests you to leave an area – LEAVE the area!**
- During evacuations, **DO NOT USE ELEVATORS!** Employees must use the stairwells, following the nearest exit signs and evacuation drawings. Check closed doors for temperature and smoke before opening.
- All passageways, entryways, aisles, storerooms, service rooms and work areas must be kept clean, orderly, sanitary and well maintained with no obstructions.
- Aisles and hallways shall remain unobstructed for evacuation and immediate access for fire response personnel and equipment.
- Flammable and combustible materials or residue in buildings or operational areas must be kept to a minimum. These materials should be stored in metal safety cans or storage cabinets that meet Underwriters Laboratories, Inc., or Factory Mutual standards.
- Material/boxes must be stacked without blocking sprinkler heads, fire exits, fire extinguishers, electrical control panels, etc.
- File drawers and desk drawers shall not be left open. Do not overload top drawers or simultaneously open multiple drawers such that cabinets may tip over.

WORKSTATION ERGONOMICS

Employees should utilize these tips to prevent stress-related injuries:

- Adjust chair height so that upper legs are horizontal and feet are flat on floor.
- Adjust chair to sit up straight and obtain proper back support.
- Avoid tilting or turning head to view the computer monitor.
- Avoid tilting your head to hold the telephone receiver on your shoulder. Employ Bluetooth when able.
- Ensure forearms and wrists are level.
- Avoid resting hands, wrists or arms on hard or sharp edges.
- Ensure computer table is just below forearm/wrist height.
- Ensure that the workstation provides adequate legroom and a measure of privacy.
- Keep arms resting comfortably at sides and shoulders relaxed.
- Place keyboard and mouse at comfortable distance from the body.
- Place frequently used items within easy reach or positioned to provide for brief exercise.
- Place document holders at the same height and distance as the computer monitor.
- Alternate tasks to break up extended periods on the computer.

SAFETY STANDARDS

Confined Space Entry

(29 CFR 1910.146 Subpart J and MSHA Part 56.16002)

This standard establishes procedures necessary for preparation, entry and restoration of a confined space to be entered by personnel. Examples of confined spaces may include, but are not limited to tanks, vessels, underground meter boxes and valve boxes. Excavations greater than four feet deep may meet the definition of a confined space if they are to be entered by personnel. These excavations shall be entered in accordance with the Excavating and Trenching Safety Standard.

Definitions

Attendant – an individual who is stationed outside a confined space which requires a permit. An attendant is required whenever a physical hazard cannot be eliminated or when a hazardous atmosphere cannot be controlled through ventilation. The purpose of an attendant is to monitor and communicate with the entrant in the event of a developing emergency or if evacuation is required.

Confined space:

- Is large enough and so configured that personnel can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit.

- Is not designed for continuous personnel occupancy.

Entrant – An individual who is authorized by the company to enter a confined space.

Entry – Begins when any part of the entrant’s body breaks the plane of the entryway. Opening hydrocarbon vessels/tanks for gauging and inspections without breaking this plane will not require a Confined Space Permit.

Entry Supervisor – An individual responsible for determining if acceptable entry conditions are present, for authorizing entry, overseeing entry operations and for terminating entry into a permit required confined space.

Permit-Required Confined Space – A space that meets the definition above, but also contains a hazardous atmosphere which cannot be controlled, or a serious physical hazard which cannot be eliminated. An Attendant must be present, and the Attendant, Entry Supervisor and Entrant must complete and sign the Confined Space Entry Permit. A permit-required confined space may be reclassified to a non-permit confined space whenever the hazardous atmosphere can be controlled or serious physical hazard is eliminated.

The Duration of the Permit is:

- Crew change, end of shift or end of job, whichever occurs first;
- Emergency conditions will cancel the permit.

Preparation for Entry

In preparation for entry, a Confined Space Entry Permit shall be completed according to the following procedure:

1. Hazards are to be eliminated or controlled.
2. Each space must be inspected and evaluated by a qualified individual (Entrant, Attendant or Entry Supervisor) prior to entry and periodically thereafter to verify that conditions remain consistent with the permit. An evaluation will include atmospheric monitoring and a thorough assessment of physical hazards.
3. Signs and/or barricades shall be posted outside confined spaces to notify unauthorized personnel when entry is in progress. If the confined space is to be left unattended, access to the space shall be secured.
4. The confined space or vessel must be properly isolated using blind flanges, line disconnection or double block and bleed isolation, in addition to locking out and tagging. A list of all blind flanges installed, line disconnects, locked isolation valves, opened vents or other energy isolating measures is required.
5. Atmospheric monitoring for oxygen, explosive gases/vapors and toxic gases/vapors shall be performed and recorded on the Confined Entry Space Permit immediately prior to entry; after work breaks or interruptions in the work procedure; and at periodic intervals to ensure the continuing safety of workers in the space. At a minimum, the following tested atmospheric hazards shall be within these acceptable levels:
 - Oxygen = 19.5% – 23.5%

Note: Oxygen must be tested for first

- Lower Explosive Limit, LEL = < 10%

- Suspected toxic air contaminants (i.e. Hydrogen Sulfide, Carbon Monoxide, etc.)
6. All practical efforts shall be made to reduce flammable gases or vapors (%LEL) as close to zero as possible in the Confined Space. If tests indicate a hazardous atmosphere, efforts to control the condition are to be made utilizing forced air ventilation. If explosive gases or vapors are present, an explosion-proof blower or air mover is required. If other conditions exist, the space must be purged, steam washed, etc. to sufficiently free the vessel of possible contaminants.

Note: Forced air may present a hazard if iron sulfide is present (see Fire Safety).
 7. Where flammable or combustible gases or liquids are present, all sources of ignition shall be eliminated or controlled.
 8. Lighting equipment must be explosion-proof and have a ground fault circuit interrupter (GFCI).
 9. If the confined space atmospheric tests are not within the acceptable limits or the physical hazards cannot be eliminated, the space is classified as a **PERMIT-REQUIRED CONFINED SPACE** and must have an Attendant and/or Entry Supervisor trained to perform these duties. The Attendant shall be stationed outside the space and remain in direct communication with the worker(s) inside. The Entry Supervisor may serve as the attendant, provided they are trained to do so.

Note: Only properly trained personnel can enter a permit-required confined space.
 10. A minimum of two individuals must be present when entering a vessel.
 11. Rescue equipment including lifelines, harnesses, air supply systems and hoists must be in use when entering all permit-required confined spaces. A trained rescue team is to be available onsite when personnel are required to enter a permit-required confined space.

Entry

Authorized personnel may make entry after preparation requirements have been met and a Confined Space Entry Permit has been signed, issued and posted at the space. Authorized personnel designated to enter the space must review the provisions of the permit and sign the permit.

The confined space atmosphere shall be re-tested as often as necessary during entry to ensure a safe work environment.

Restoration

When work is complete and the confined space is ready to be returned to service, the permit shall be used as a checklist for proper restoration of the space. Additional items to consider include:

- Are all personnel out of the space?
- Are all blinds removed, vents closed, etc., per the list compiled during preparation?
- Are all equipment and tools removed?
- Are all entryways and flanges closed and sealed?

- Have start-up procedures been reviewed?

Program Review

Completed permit-required confined space entry permits must be maintained at the site office for review.

SAFETY STANDARDS

Electrical Safety

(29 CFR 1910.301 Subpart S and MSHA Parts 56.12001 – 12071)

This section contains basic electrical safety practices.

Definitions

Qualified Person (OSHA) – Characterized by the person whose work requires that they become familiar with the hazards, construction, operation and maintenance of equipment that may involve potential contact with exposed energized parts, and be trained to perform the required tasks safely. A Qualified Person shall perform all equipment modifications, repairs and installations involving exposure to energized parts.

Unqualified Person (OSHA) – Persons who operate electrically powered equipment but are not trained to perform any operation or maintenance on or near any exposed energized parts.

Electrical Safety Rules

Note: The term "work on" energized equipment includes the testing of energized electrical circuits.

- Only a Qualified Person shall repair, install, troubleshoot or work on electrical circuits. All electrical circuits should be de-energized whenever possible before an employee works on or near the electrical equipment.
- All employees are to be trained in the hazards of working on or near energized electrical equipment.
- All electrical circuits are to be considered energized until the absence of electrical current is verified by a Qualified Person.
- An approved Energy Isolation (LO/TO) program must be utilized to isolate the energy source.
- Work on an energized circuit will only be done as a last resort when LO/TO makes the circuit unsafe or testing and troubleshooting of the circuit requires it to be energized.
- Use suitable protective equipment and tools rated for the appropriate voltage and flash hazard, including, but not limited to lineman's gloves, mats, blankets and flash suits to provide insulation from energized circuits and arc flash.
- Un-insulated metallic items, such as rings, neck chains, watches, eyewear, etc., are not to be worn while working on or near exposed energized electrical circuits.

- Electrical interlocks must not be rendered inoperative by removal, modification or destruction. Electrical interlocks may be defeated only temporarily during the performance of a specific task and must be returned to working condition immediately thereafter.
- Blown fuses shall be replaced with equal type and interrupting rating using the appropriate fuse tool and Personal Protective Equipment.
- Fuse pullers will be used for changing electrical fuses.
- Non-conductive ladders must be used when working on or near electrical equipment or conductors. The use of metal ladders and stools is prohibited.
- Defective electrical equipment and extension cords are to be inspected and immediately removed from service if found to be unsafe until repairs or replacement can be performed.
- Portable cord and plug-connected equipment shall be inspected prior to each use and be equipped with a cord, which has ground fault protection or is double insulated.
- Lighting fixtures will be kept in working order. Broken or burned out bulbs will be replaced promptly. Vapor proof globes and guards will be placed over lights where necessary.
- Electrical equipment (including lights, radios, pagers, blowers, etc.) used within a 5-ft. radius of the well bore, shale shakers or mud pits will be explosion-proof.
- Shop lights on drop cords will NOT be lowered into the well bore for light.
- Extension cord sets are not permanent installations.
- Secure extension cords to prevent tripping hazard.
- GFCIs are to be tested prior to use.
- An assured grounding program shall be established and followed if GFCI devices are not used.
- Safety grounds shall be used when working on electrical circuits and equipment.
- Non-conductive mats will be placed in front of electrical switchboards in Motor Control Centers (MCC) and maintained in clean condition.
- All voltage panels will be clearly labeled “DANGER – HIGH VOLTAGE.”
- All equipment will be properly grounded per manufacturer specifications.

Power Lines

- All power lines should be considered energized.
- When power lines are de-energized, they shall have safety grounds attached.
- No part of a crane, boom, mast, gin poles or machinery should be permitted within 10-ft. (3 m) of the power lines rated 50 kV or below. For energized lines rated above 50 kV, the minimum distance between

power lines and the boom, mast, crane or its load must be 10-ft. (3 m) plus one half-inch (1 cm) for each kV over 50 kV.

Energy Isolation (LO/TO)

(29 CFR 1910.147 Subpart J and MSHA Parts 56.12016, 12017 and 14105)



This standard establishes minimum requirements for controlling energy sources during the service, repair or maintenance of machinery and equipment. These requirements will aid in preventing injury to personnel, damage to property and damage to the environment due to the unexpected energizing, start-up or release of stored energy. Sources of stored energy include electrical, mechanical (pumping units, mud pumps), hydraulic, pneumatic, compressed natural gas lines, natural gas flow lines and any other source of stored energy.

Procedures

Detailed written lockout/tagout (LO/TO) procedures have been developed and are available at each operating Area. It is the responsibility of Operations personnel to develop and maintain all site specific LO/TO procedures.

Note: Supervisors are responsible for performing and documenting the Energy Isolation (LO/TO) program at each site.

Locks and Tags

- Locks, tags and other LO/TO hardware required by this standard must be available to workers at all times. Contractors must provide their own locks, tags and other hardware when performing LO/TO.
- LO/TO locks and tags must not be used for any purpose other than LO/TO.
- Tags must include the following information:
 - condition or reason for tagging
 - date
 - equipment being tagged
 - name of person applying tag
 - DANGER – DO NOT OPERATE or similar warning

Preparation and Installation

- The work area and equipment should be surveyed to identify isolation points and the proper methods of energy isolation.
- The machine, equipment or process must be shut down.
- Any stored hazardous energy must be isolated and relieved by closing valves, de-energizing switchgear, opening vents, disconnecting, restraining or blinding. Reviewing the most current flow or equipment diagram will assist in locating all isolation points. Blinds shall be installed when the release of combustible or toxic liquids, vapors or gases into the work area cannot be controlled.
- ***The energy source must be locked out through the use of*** locks, blinds, chaining of valves, double block and bleed systems, disconnecting pipe or by other means that prevent the release of energy.

Note: Double block and bleed is a method used on process piping where block valves are closed, locked, tagged and the bleed valve located between the two block valves is locked open to vent to atmosphere. A closed valve with a body bleed does not constitute a double block and bleed.

- The lockout device should be tagged with a DANGER – DO NOT OPERATE, or other appropriate tag designed to conform to the Company’s LO/TO program.

Note: Each person doing the work shall install a lock and tag. There must be only one key for a lock or set of locks, and that one key will be held by the locking personnel until completion. The “crew lockout” method is acceptable only where it is defined in a written document and approved by HSE manager.

- The area must be cleared of personnel and tools before attempting to relieve any stored energy remaining in the equipment prior to beginning the work.
- The equipment should be energized (by starting and stopping before beginning the work). Start/jog switches should be verified they will activate equipment prior to being de-energized.

Restoration and Removal

- Only the person(s) originally attaching the lock and tag is authorized to remove the lock and tag. If this person is unavailable, the supervisor or his/her designee, after complete inspection of the affected area, may assume responsibility for removal of the lock and tag and notification of all parties.
- Only qualified personnel are allowed to start up machinery or equipment after it has been determined that no personnel are exposed to any hazards and all safety checks have been completed.

Note: In the event that shift or personnel changes occur during maintenance or repair activities, the designated DTC Energy Group site supervisor must take necessary steps to maintain the continuity of the LO/TO protection. This shall ensure the transfer of lockout/tagout devices between affected employees is correctly accomplished.

Restoring Equipment to Service

- All guards must be reinstalled.
- All electrical wiring must be returned to conform to electrical code requirements.
- All blind flanges or skillets must be removed and piping properly connected.
- Tools, materials and other nonessential items should be removed.
- All machine or equipment components should be inspected and verified they are operationally intact.
- Employees in the area should be notified that LO/TO devices are ready to be removed.
- Personnel should verify that all employees are safely positioned or removed from the area.
- Each lock and tag from each energy-isolating device should be removed.

Working on Energized Electrical Equipment

If work requires that the electrical equipment be worked on while energized (i.e. bumping motors, maintenance testing, etc.), the following procedures apply:

1. Work on energized electrical equipment will only be conducted by qualified personnel with a safety observer present.
2. Safety observer (certified in First Aid/CPR) shall maintain direct communication with worker(s) during troubleshooting and/or adjustments to exposed energized equipment.
3. Personnel shall be notified of the activities being performed, the location, equipment affected and duration of work.
4. Equipment should be marked with a "DANGER – DO NOT OPERATE" tag.
5. Employees shall refer to the Electrical Safety section of the handbook for more details regarding electrical work.
6. All affected personnel shall be notified when work is completed.

Excavation and Trenching

(29 CFR 1910.650 Subpart P and MSHA Parts 56.3400, 3401 and 3430)

This standard applies to all excavations 5-ft. (1.5 m) in depth or more and intended for worker occupancy. In addition to the following steps, a Confined Space Entry Permit may be required for personnel entry into such excavations that have the potential for hazards (i.e. atmospheres, cave-ins) which cannot be controlled, or serious safety hazards which cannot be eliminated. All excavations must meet or exceed OSHA requirements found in 29 CFR Part 1926 – Subpart P – Excavations, or MSHA Part 56 (for mining activities).



Definitions:

Benching – A method of protecting employees from cave-ins by excavating the sides of a trench to form one or a series of horizontal levels, or steps, usually with vertical or near-vertical surfaces between levels.

Competent Person – One who is formally trained and capable of identifying existing and predictable hazards, soil types in the surroundings or working conditions that are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

Excavation – Any man-made hole, cavity, trench or depression in an earth surface formed by earth removal.

Shoring/Trench Box – A structure such as a metal, hydraulic, mechanical or timber shoring system that supports the sides of an excavation, and which is designed to prevent cave-ins.

Sloping – A method of protecting employees from cave-ins by excavating to form sides of an excavation that is inclined away from the excavation. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure and application of surface loads.

Soil Classification System – Denotes classification used by the National Bureau of Standards (Exhibit III).

Classifications include:

- Stable Rock – Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
- Type A Soil – A cohesive soil with an unconfined compressive strength of 1.5 tons/ft (tsf) (14.6 Mg/m²) or greater. Examples: clay, silty clay, sandy clay, clay loam, silty clay loam, sandy clay loam, caliche and hardpan. (If a soil is fissured, subject to vibration or previously disturbed, it is considered Type B or C.)
- Type B Soil – A less cohesive soil with an unconfined compressive strength greater than 0.5 tsf (4.9 Mg/m²) but less than 1.5 tsf (14.6 Mg/m²). Examples: angular gravel or crushed rock, silt, silt loam, sandy loam and dry rock that is not stable.
- Type C Soil – The least cohesive soil with an unconfined compressive strength of 0.5 tsf (4.9 Mg/m²) or less. Examples: gravel, sand, loamy sand, submerged soils or freely seeping soils and submerged rock that is not stable.

Note: The thumb penetration test can be performed by a Competent Person to estimate the unconfined compressive strength of cohesive soils.

Type A soils can be readily indented by thumb only with great effort.

Type B soils can be penetrated by thumb approximately halfway.

Type C soils can be easily penetrated several inches by the thumb and can be molded by light finger pressure.

Procedure

1. Each excavation must have someone formally trained and designated as a competent person; that person will conduct and document daily inspections (more often if needed) if personnel will be required to enter the excavation.

Additional inspections are required after significant rainfall or freeze/thaw occurrences.

2. No individual(s) will be permitted to enter an excavation unless it is deemed necessary.
3. Before opening any excavations, personnel shall:
 - Determine the location of utility installations, such as sewer, telephone, fuel, power lines, water lines, pipelines or any other underground installations
 - Utilize the “one-call” or appropriate notification system to contact utility companies and other affected parties. Advise of proposed work prior to the start of actual excavation. Municipalities or other regulatory agencies may require permits.

4. Excavations, 4-ft. deep or greater involving entry require ladders, steps or ramps located so that no more than 25-ft. (7.6 m) of lateral travel is required to exit the excavation.
5. The walls of the excavation are to be protected from caving-in by one of the following:
 - Shoring
 - Sloping or benching (Note: Benching is only allowed on A and B Soil.)
 - Trench boxes (shields) – if used must extend a minimum of 18 inches above the vertical side of any excavation.
 - Some other equivalent means approved by a registered professional engineer from the state where the excavation is located. Note: Sloping or benching for excavations greater than 20-ft. (6 m) deep must be designed by a Registered Professional Engineer.

Note: If the excavation requires a person’s head to be below ground level, appropriate precautions shall be in place to address hazardous atmospheres. If the excavation is less than 5-ft. in depth and personnel entry is necessary, cave-in protection may be required if the soil exhibits unstable soil characteristics.

Maximum Allowable Slopes for Excavations

Soil or Rock Type	Horizontal or Vertical	Less than 20 ft. (6 m)
Stable Rock		(90 degrees)
Type A	3/4:1	(53 degrees)
Type B	1:1	(45 degrees)
Type C	1.5:1	(34 degrees)

Excavation and Trenching General Safety Rules

- Excavations more than 4-ft. (1.2 m) deep may be considered confined spaces and may require a permit in accordance with the Confined Space Entry Safety Standard.
- Excavated soil, materials or equipment that could pose a hazard by falling or rolling into an excavation shall be stored and/or retained at least 2-ft. (0.61m) from the edge of the excavation. If excavations endanger the stability of adjacent structures (building, walls, or other structures), support systems shall be provided.
- Soils can become unstable from heavy equipment operation in the vicinity of the excavation.
- Guardrails or barricades should be used to mark the limits of the work area. Any time a trench is left unattended in populated areas, use guardrails or barricades sufficient in size to prevent unintentional entry.
- An employee shall not be directly underneath the operating equipment while it is being lowered or raised in an excavation or trench.
- Employees exposed to public vehicular traffic must wear reflective/high-visibility warning vests.

Fall Protection

(29 CFR 1910.23 Subpart D and 19260.501 Subpart M and MSHA Part 56.15005)

Drilling, completions and production operations are subject to the requirements of OSHA's general industry fall protection standard of 4-ft. [29 CFR 1910.23]. Construction of well pads, compressor stations, installation of pipeline and compression equipment, as well as the construction of impoundments and ponds, are subject to the requirements of OSHA's construction industry fall protection standard of 6-ft. [29 CFR 1926.502]. Fall Arrest Systems are to be used when other fall protection systems are impractical or insufficient (i.e. scaffold work requiring top and mid-rails to be removed).

General Requirements

- 100% fall protection must be maintained at all times while performing elevated work, to include the use of two lanyards if needed to allow the employee to remain anchored to one point while moving to the next point. This requirement does not apply to work being performed from portable ladders.
- The use of waist belts for fall arrest and non-locking snap hooks is prohibited.
- Anyone going up or down the derrick ladder will wear a full-body harness secured to an anti-fall device (Ex: static line with safety sleeve, notched rail or self-retracting lifelines). The counterweight system alone will not be considered adequate fall protection for climbing up or down the derrick ladder.
- The double-locking hook on a self-retracting lifeline will be hooked directly into the dorsal D-ring on the back of the full body harness. The retractable spool will not be hooked into a shock absorbing lanyard.
- Self-retracting lifelines that have been subjected to a load will be removed from service and forwarded to a manufacturer's approved repair facility for overhaul and/or inspection.
- Self-retracting lifelines will be inspected every other year by the manufacturer or his designated representative. Maintenance and inspection will be documented and maintained on site.
- To minimize fall distance, the tie-off or anchor points should be at the height of the D-ring or higher.
- To minimize swing falls, tie-off or anchor points should be as close as possible to directly above the head.

Fall Arrest Systems

Fall Arrest Systems shall include:

- A full-body harness with D-ring in the middle of the back situated in-between the shoulders and a double EZ-Stop lanyard (2 lanyards)
- An appropriate anchorage attachment capable of supporting at least 5,000 lb. static load Connectors

The system may include a lanyard deceleration device, lifeline or suitable combination of these.

Before donning the fall arrest system, the employee shall:

- Inspect Fall Arrest components prior to each use.
- Remove from service and destroy damaged components or equipment that has experienced a fall.
- Ensure Fall Arrest equipment is not to be used to hoist equipment/materials.

If an employee is working in an area where they could fall into and be submerged in water, an approved type 1 or type 2 life jacket or buoyant work vest must be worn, and at least one life saving skiff or boat should be immediately available.

Ladder Safety – General

(MSHA Part 56.11003)

- When climbing up or down any ladder, personnel should face the ladder and maintain a 3-point contact with hands free of materials.
- Personnel should keep body centered between the ladder side rails (or within the width of the cleats) when climbing and while working. Personnel should not overreach or lean while working from a ladder.
- All ladders must be inspected before each use. Damaged ladders should be removed from service until repaired.
- If work from a ladder is long-term in nature or requires heavy physical exertion, other methods such as scaffolds or personnel lifts should be used.
- Metal ladders must not be used for electrical work.

Non-Self-Supporting Ladder (Portable Extension Ladder)

- Ladder shall be positioned at a safe angle, which is typically a 4:1 vertical to horizontal ratio.
- The ladder shall be secured at the point of support to prevent movement. To accomplish this, a person will stabilize the ladder at the bottom while the climber climbs and secures the ladder at the top. If a ladder cannot be secured at the top, outriggers or another employee must stabilize the ladder while it is in use.
- A portable extension ladder must extend 3-ft. (1 m) past the point of support when accessing a working surface (i.e. roof).

Self-Supporting Ladders (Portable Step Ladders)

- A stepladder must be used with the spreader bars in the locked down position.
- A stepladder shall never be used as a straight ladder.
- Do not stand on the top two steps of a self-supporting ladder.

Personnel Lifts

- Personnel in a man-lift basket will maintain 100% fall protection to the basket.
- Personnel working in a man-lift basket desiring to transfer from the basket to any other elevated surface or substructure, will first tie-off to the next object before removing his lanyard from the man-lift basket.
- Personnel must work with both feet securely on the floor of the platform. Working with feet on a rail or working from a ladder placed in the personnel lift is prohibited.
- All entrance gates or chains must be in their fully closed position before moving the lift.
- Lift controls and the structural integrity of the lift shall be inspected/tested each day prior to use.

- Personnel should never tie off to an adjacent pole, structure or equipment while working from within the personnel basket.

Scaffolds

(MSHA Part 56.11027)

- A Competent Person must be appointed to oversee scaffolding erection and disassembly.
- Only heavy-duty pole and tube and coupler scaffolds should be used.
- Scaffolding will be kept clean and in good condition. It will be inspected prior to each rig-up for cracks or other damage.
- Footing shall be sound, rigid and capable of carrying the maximum intended load. Unstable objects such as bricks, blocks or boxes must not be used.
- Scaffold heights greater than 4 times the base must be properly secured to the working structure unless otherwise noted by the manufacturer.
- When working under a scaffold, overhead protection is required.
- Working from portable ladders on the scaffold platform is prohibited.
- Appropriate guardrails shall be utilized on all scaffolds. Toe boards must be installed on platforms that are 10-ft. (3.05 m) above ground level or walkways that are 6-ft. (1.8 m) above ground level.
- Fixed or secured portable extension ladders must be used to access scaffolding if no built-in ladders are present.

BOP Scaffolding

- Metal-type scaffolding will be used around the BOP stack to provide a stable, non-slip working surface unless other appropriate means of fall protection are provided.
- Scaffolding will be tied on both ends to the hangers/ladders that support it to prevent side movement or vibration.

Stairs

- Personnel will keep one hand on the handrail at all times while climbing up or down stairs. Personnel will not try to carry things up or down stairs that require more than one hand to hold. One hand will be kept free and on the handrail at all times.
- Sliding down handrails, skipping steps or running on steps is prohibited.
- Stairs, steps and walkways will be kept free of obstructions. Stairs, steps, walkways and handrails will be kept clean of mud, grease, dirt or other slippery materials. Stairs or steps will be utilized whenever they are provided.
- Stair landings will be kept clear of slip, trip or fall hazards.
- Stairs will be bolted down or securely pinned with a pin and keeper combination so as to prevent any movement.

Walkway / Mud Pit Guarding and Grating / Cellar Covers

- Walkways and mud pit tops will be kept clear of obstructions (hoses, tools and equipment) and slip hazards at all times.
- All grating or floor plating will be kept in its proper position and secured to prevent slip, trip or fall hazards. All holes larger than 2 inches will be covered.
- All grating will be properly supported with braces.
- Sections of grating that cannot be returned to the correct position will be barricaded and flagged with caution/danger tape to reroute normal traffic until properly repaired.
- Shortcuts around fixed walkways are prohibited. All personnel will take the time necessary to use established walkways.
- Personnel will not climb outside of handrails bordering normal traffic areas to perform work or repairs unless secured with proper fall protection.
- Cellar complete with cellar ring will be installed on each well prior to moving in and rigging up.
- Cellar cover will be constructed of expanded metal and placed over the top of the cellar at the start of each new well to reduce potential fall hazards.
- Wood pallets should not be used as walking/working surfaces as they contribute heavily to slips/trips/falls and ankle injuries.

Personal Hoisting Operations

(29 CFR 1910.68 Subpart F and 1926.552 Subpart N and MSHA Part 56, Subpart R)

Personnel hoisting will only be performed after all other alternative methods of ascending or descending (e.g., ladders, stairs, scaffolding, etc.) have been considered and personnel hoisting is determined, by the rig or location manager, to be the safest means of reaching the desired work area or for performing the task.

1. The use of screw-pin shackles or outward-opening, safety-rated "Surelock" style hooks is prohibited for use in personnel hoisting operations.
2. Personnel elevated with a hoist attached to a single-point suspension system will wear a full-body harness with permanently stitched seat – purpose-built for personnel hoisting operations and approved by the manufacturer as personal fall arrest equipment. No other full-body harness, bos'n seat, riding belt, other single-point suspension system or manufacturer's equipment will be used for personnel hoisting.
3. For drilling operations the mechanism used to attach the harness to the hoist system will be a Bolt Type Anchor Shackle (BTAS). The BTAS used for personnel hoisting will be painted orange so as to designate it for personnel hoisting operations only. The orange BTAS will NOT be used for any other hoisting or material-handling application. The use of screw-pin shackles or outward-opening, safety-rated "Surelock" hooks is strictly prohibited.

4. The retaining mechanism used in a BTAS will be a 1-inch or larger split ring in lieu of cotter key provided by Crosby. The cotter key represents a laceration hazard.
5. Personnel elevated with a hoist will also utilize an independent means of fall arrest in the event of a hoist system failure. Example methods of independent fall arrest include:
 - DBI-Sala self-retracting lifeline (Model #'s: 3403401 (50-ft), 3403501 (85-ft), 3403601 (130-ft) or 3407626 (175-ft) suspended in the derrick with self-locking snap-hook attached directly into the dorsal D-ring on the personnel hoisting harness.
 - 3/8-inch static line constructed of (7x19) galvanized solid core cable with DBI-Sala swivel safety sleeve (Model # 1220368) attached to the dorsal D-ring on the full body harness using the 18-inch fall suppression lanyard stitched directly into the swivel sleeve.
6. Personnel will NOT ride the traveling blocks or drill pipe elevators at any time to or from any place.
7. Personnel will NOT be transported from the rig floor to the derrick board or return using a rig floor hoist or winch. Personnel needing to ascend to or descend from the derrick board will use the derrick ladder and associated ladder safety device / fall arrest system.
8. Personnel elevated with a hoist will NOT attempt to get out of the personnel hoisting assembly, full-body harness or BTAS while elevated above the rig floor. Disconnection from the personnel hoisting system may only occur at the level where the personnel hoisting activity began. Examples include: (a) at the rig floor for operations in the derrick or mast, or (b) at the drill deck or ground level for operations under the rig floor.
9. Each rig and yard operation that conducts personnel hoisting activities will develop a JSA specific for the activity of "Lifting Personnel with a Winch." The JSA will be reviewed prior to each personnel hoisting activity.
10. Drilling operations and/or rotation of the drill string with either the kelly or top drive will be temporarily stopped any time someone is hoisted above the rig floor in a hoist.
11. Personnel will NOT be hoisted up the V-door using a hoist. Personnel will NOT be suspended on a hoist line under the rotary table.
12. Operator will never take eyes off the rider or designated flagger while elevating personnel. Only the rider or designated flagger will give hoisting signals to the Operator. Operator will NOT anticipate riders' movements or desires.
13. Riders will have all tools secured and tied off properly prior to being elevated by the hoist. Example: grease gun, sledgehammer and wrenches.

Hot Work

(29 CFR 1910.252 Subpart Q)



A Hot Work Permit is required for the following maintenance/ construction operations:

- Hot work within 100-ft. of an area where combustible, flammable vapors or liquids could reasonably exist. Hot Work sources may include:
 - Open flame
 - Welding or burning
 - Grinding
 - Use of brush and armature equipment
- Welding on lines in service, hot cuts or hot-tapping requires Hot Work Permit(s).
- A Hot Work Permit is not required if the work is performed in a designated Hot Work area. Designated Hot Work areas on drilling locations should be no less than 100-ft. from the well bore and not less than 50-ft. from vegetation or other combustible materials.

General Hot Work Requirements

- Cutting or welding should only be performed by qualified welders.
- Proper fire prevention equipment should be on hand before cutting or welding begins.
- When welding or cutting in a hazardous area, one person should be designated as a “Fire Watch.” This person should stand by with a fire extinguisher and be trained in its use.
- Cutting or welding on any derrick or load bearing rig structure is prohibited without appropriate approval.
- No field welding is permitted on tongs, elevators, bails, blowout preventers, choke manifold or other heat-treated equipment.
- LEL monitors must be approved and properly maintained.

The Duration of the Permit is:

- Crew change, end of shift or end of job, whichever occurs first;
- Emergency conditions will cancel the permit.

Hot Work with Gas/Air Atmosphere in Vessel

Hot Work such as flame cutting, welding, grinding and sandblasting may be done on a vessel or pipe when atmospheric gas concentrations do not exceed 10% of LEL. The atmospheric measurements will be taken with the

gas monitor's probe in or as close to the vessel or pipe as possible. Personnel shall not enter the vessel or pipe to perform monitoring. See Confined Space Entry standards.

Procedure

1. Employee initiates the permit and submits it to the DTC Supervisor for approval.
2. The DTC Supervisor or designated Job Representative reviews the job, adds precautions such as a "Fire Watch," O₂ levels, % Lower Explosive Limit (%LEL) and qualifications of welders.

Note: The Hot Work Permit requires that employees monitor for O₂ and %LEL levels (other gases may apply) before the job begins. Periodic or continuous monitoring must be performed to ensure safe levels persist.

3. The Supervisor or designated Job Representative then signs the permit.
4. Workers should not be allowed in a vessel when the LEL level is in excess of 10%. This level will cause all hot work to be discontinued immediately. The permit will be cancelled and declared null and void. A new permit must be reissued prior to the restart of work after the LEL level is lowered.
5. A copy of the hot work permit is to be posted at the worksite; other copies are maintained in the office for at least 30 days or the duration of work at the site.
6. The area should be checked for changing conditions as the job is performed. This should include O₂, % LEL and toxic materials.

Cutting and Welding

(29 CFR 1910.252 Subpart Q and 1926.350 Subpart J and MSHA Parts 56.4600, 4603, 4604, 14213 and 15007)

- All cutting and welding equipment will be inspected prior to use.
- All ground connections should be securely made and kept in good condition to eliminate arcing.
- Oxygen and acetylene hoses should be inspected for leaks, damaged fittings, etc., on a job-to-job basis.
- Cylinders should be handled carefully. They must not be handled roughly, dropped or knocked around. They should be secured upright at all times.
- Protective caps should be placed on both full and empty cylinders while they are being moved or transported.
- The proper regulator should be attached before using gas from the cylinder.
- Oxygen cylinder fittings should be kept clean and free from oil and grease.
- Main supply valves must be closed and bled down after completing cutting operations.
- Welding leads are to be inspected daily by the welder for insulation breaks.
- Cutting torches must not be left unattended in tanks or void spaces because leaks could cause an explosion.

- When welding drive pipe or any object connected or supported by the block, a ground wire must be attached to prevent electrical arching of the drilling line, crown, block bearings, drawworks, etc.

Remember: Oxygen and oil or grease products DO NOT MIX, such a combination could result in a spontaneous fire or explosion. Oxygen is not to be used to clear work area or clothes.

Tagging and Flagging

(29 CFR 1910.147 Subpart J)



Danger tags indicate that a hazard exists and a “DANGER – DO NOT OPERATE” tag or similar wording shall be used in the following situations:

- Valves not in normal operating position
- Defective valves, equipment or tools
- Safety or emergency equipment unfit for use

Note: For equipment undergoing maintenance, personnel should refer to the Energy Isolation (LOTO) Safety Standard in the handbook and local Energy Isolation Procedures.

Procedure

1. The items listed above shall be tagged in the following manner to ensure proper attention.
2. The following shall be noted on the tag:
 - Condition or reason for tagging
 - Date
 - Equipment being tagged
 - Signature of person applying the tag
3. Tagging should be documented in the operations log or LOCKOUT/TAGOUT Log.
4. Tag should be properly attached with a nylon tie-rop.
5. If the tag is not readily visible, a flag (bright-colored ribbon) must also be attached. Flags never substitute for a tag.
6. Local personnel/supervision should be notified upon completion of the work.
7. Tags and flags should be removed after normal operating conditions are restored.

MOTORIZED EQUIPMENT

Workers who operate motorized equipment on behalf of the company are responsible for the safe operation of that equipment. Motorized equipment can include forklifts, cranes, backhoes, bulldozers, etc. The company has established the following minimum requirements for the operation of motorized equipment.

General Precautions

(MSHA Part 56 Subpart M)

- Whenever there is a safety concern, the operator will have the authority to stop and refuse to handle loads or continue operations as safety dictates.
- Only qualified personnel shall operate motorized equipment. The individual training will be specific to the type of equipment and the applicable regulatory agency requirements. Supervisory personnel should exercise extreme caution if asked to operate motorized equipment and be trained as appropriate for the task.
- All affected utilities are to be identified and notified using the One-Call system before beginning any excavation work or use of heavy equipment.
- An operator must perform a 360-degree walk-around before operating equipment.
- No equipment shall be operated when any part of that equipment can encounter overhead lines. Personnel must maintain a minimum of 10-ft. clearance from lines. (See Electrical Safety section of this handbook.)
- Before moving tall equipment, personnel should review travel route for low-hanging power lines and other low clearance structures.
- Ground personnel should maintain a safe distance from operating equipment and establish eye contact with the operator before approaching.
- When climbing onto or down from any piece of equipment, the operator must maintain 3 points (e.g., 2 hands and 1 foot) of contact with the equipment or with the equipment and the ground. The operator should not jump from the equipment to the ground.
- Personnel shall not be allowed to ride on or work off any part of the equipment unless specifically designed for personnel.
- Ground personnel shall be notified when the operator's visibility is obstructed in any direction. Spotters should be used to assist the operator in such cases, especially when backing into congested areas or groups.
- No employee shall move or allow construction equipment and/or vehicles to be moved on any access roadway or grade unless that roadway or grade is constructed and maintained to safely accommodate the movement of the equipment and/or vehicles involved.
- All equipment shall be operated in a manner that will not cause injury to the operator or fellow workers. If conditions are present which may injure or harm a worker, – i.e. muddy conditions, lightning, mechanical problems, etc. – equipment operation must be suspended until the problem is resolved.
- Wheels of trucks and rubber-tired heavy equipment must be chocked when parked on inclined grades.

- All powered or motorized equipment shall be left in a zero energy state during breaks and at the end of the shift. All hydraulic and auxiliary power systems shall be de-energized. Buckets, lifts, forks, blades, etc., shall be lowered to the ground before being left unattended.
- No machinery or equipment shall be stored or left temporarily near a highway grade crossing in such a manner as to interfere with the sight distances of people approaching the crossing.
- Prior to beginning work, contractors must establish a designated equipment storage area that meets company and local authority approval.

Work Zone Safety

(23CFR SUBCHAPTER 924 AND 49 CFR SUBCHAPTER 571 AND MSHA PART 56.9100)

Employees in field operations are sometimes required to set up “work zones” near public roads. Drivers are to position vehicles as far off the road as possible before setting up the work zone.

These work zones shall be set up in accordance with the appropriate local, state and federal regulations. Refer to the Department of Transportation Federal Highway Administration **Manual for Uniform Traffic Control Devices (MUTCD)** on procedures for obtaining basic uniformity of traffic control devices. These precautions typically include setting up cones and warning signs, proper communications systems and flagging signals, reflective worker’s vests and strobe lights on vehicles. The following signs/flagging signals (Exhibit I) should be used when directing traffic in work zones.

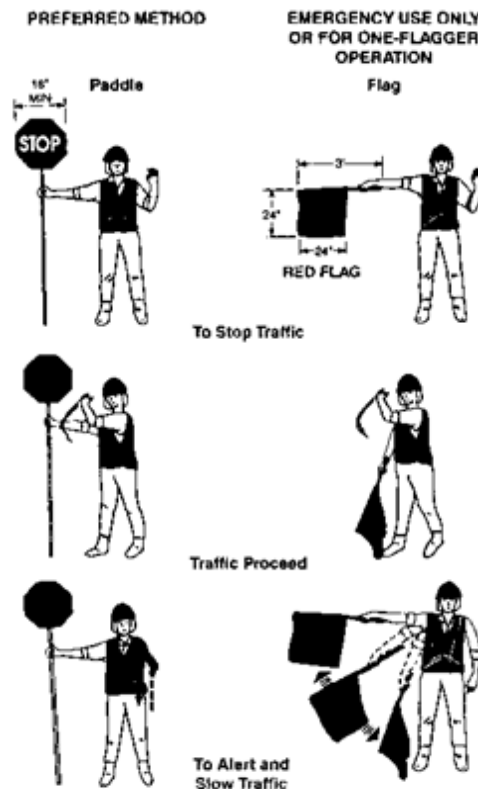


Exhibit I

Vehicle Safety

(MSHA PARTS 56.9201 AND 9202)

Drivers who operate company vehicles, rental vehicles or their own vehicles on behalf of the company are responsible for the safe operation of that vehicle. Before operating a company vehicle, drivers are required to complete a safe-driving course approved by the HSE Department and become familiar with other vehicle operating policies within the company. Additionally, these rules are to be followed:

- Drivers must maintain a valid driver's license (for the state where they reside) at all times for the type of vehicle they will be driving. Any changes in status must be reported immediately to their supervisor.
- Drivers must safely operate vehicles in accordance with all applicable laws, including DOT requirements, when applicable.
- Cell phones may be used sparingly while operating a motor vehicle if state or local laws permit.
- Vehicles are to be maintained in a safe, operating condition and any unsafe condition should be corrected.
- Vehicles left running while unattended shall be put in park with the parking brake on.
- Drivers of vehicles must require that all occupants wear seat belts before moving the vehicle.
- Drivers must report all vehicle incidents/accidents immediately, no matter how minor.
- The use, possession and distribution of illegal drugs, deadly weapons or unauthorized explosives while on Company premises, or in Company, rental or personal vehicles on Company business is prohibited. Likewise, the consumption of alcoholic beverages or driving under the influence while operating Company, personal or rental vehicles while on Company business is prohibited.
- Drivers must conduct a 360-degree walk-around when returning to their vehicle to begin and/or continue their driving duties.
- Vehicles will be driven with headlights or daytime running lights on at all times.
- When parking, personnel should "pull through" or back into the space, unless doing so would create a hazard.
- Drivers are to obey all rules and laws, facilitating the flow of traffic and general safety, while driving.
- Barriers should be used to secure loads that may shift within the cab of vehicle.
- Personnel will NOT ride in the back of open-bed pick-up trucks or on truck running boards.

Safety and Emergency Equipment for Company Vehicles

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. All equipment will be properly installed and secured. Supervisors may increase such equipment in accordance with driver and equipment exposure, such as tire chains, hydraulic jacks and flashlights.

Automobiles:	1 – First Aid Kit and related supplies 1 – 5 lb. ABC Fire Extinguisher
P/U or Trucks:	1 – First Aid Kit and related supplies 1 – 5 lb. ABC Fire Ext. (Minimum) * Recommend 20 lb. Fire ext. or greater 3 – 12" x 12" Red Flags – (Min. size)* 3 – Reflective Triangles*

* Required on certain DOT Commercial Motor Vehicles.

Forklifts

(29 CFR 1910.178 Subpart N and MSHA Part 56.16016)

Although forklifts are indispensable tools for moving heavy objects, their operation and proper maintenance require special precautions and training. The use of forklifts is restricted to trained personnel that have been authorized by their supervisor to operate the forklift.

All forklift operators must be trained and have a skills evaluation test every three years. Refresher training is also required whenever one of the following occurs:

- The operator is involved in an incident or a near miss.
- The operator has been observed operating the equipment in an unsafe manner.
- The operator has been determined in an evaluation to need more training.
- There are changes in the workplace that could affect safe operation (i.e. different types of paving, reconfigured storage racks, new layout with narrower aisles or restricted visibility).

Forklift Standards

- Personnel should complete an inspection checklist before each use. This includes checking for warning and safety devices. Any deficiency must be reported to supervision.
- Seat belts shall be used when operating forklifts.
- To prevent movement, brakes should be set and the wheels blocked on a trailer or truck that is being loaded or unloaded.
- When the forklift is not in use, the forks must be positioned rack down and tips pointing toward the ground.
- Only loads within the rated capacity of the forklift should be handled.

- Loads should be carried low, with forks just off the ground and tilted slightly back.
- Do not allow any person to stand or walk under elevated forks, whether loaded or empty.
- 55-gallon drums should be moved on pallets, a drum rack, in a basket or with a drum-handling extension. Drums shall not be moved by “sandwiching or spearing” them between forks.
- Do not use a forklift to raise people for overhead work without an approved, load rated platform equipped with forklift-compatible attachments.
- Forklift shall be "shut off" before an operator exits the equipment.



Gin-Pole, Winch Truck and Crane Operations

(29 CFR 1910.179 Subpart N and – 1926.550 Subpart N)

- The surroundings must be surveyed for power lines and other obstructions prior to initiating gin-pole, crane or lifting operations.
- Gin-pole truck drivers will not drive within 10-ft. of a power line. In the event a driver contacts a power line with his gin-pole, the driver should remain in the truck and avoid touching any metal objects until power has been secured from the power lines. No one in the vicinity of the truck should touch it until the power is completely secured.
- All personnel should maintain a safe buffer zone of 10-ft. from any load that is lifted or tail-boarded on a truck or trailer.
- The winch truck operator will take signals from one designated flagger at all times.
- Anyone may signal an emergency stop during winch truck operations.
- Winch truck operators will minimize the height of suspended loads during transport. Loads will be kept close to the ground.
- Winch truck operators and swampers will not lift any load with lifting slings or rigging that creates a 45-degree or lesser angle with the load. All loads will be properly rigged prior to lifting.
- Personnel will not walk or position themselves under suspended loads or between the lifted load and the tailboard of the truck.
- Winch truck operators will not leave the winch controls while a load is suspended.

- Winch truck operators will wear the proper personal protective equipment any time they leave the cab of the winch truck.
- Cotton or leather gloves will be worn by anyone handling a winch line or wire rope sling. Use Extreme Caution!
- Personnel will stand to the side and “out of the line of fire” when releasing chain binders.
- Only ratchet-type binders will be used by DTC trucking operations.
- Personnel releasing chain binders will ensure the object secured by the binder is stable before releasing the load. If the load is unstable, the employee will ensure the crane or gin-pole truck is tied off to the object before releasing the binders.
- Winch truck lines should not be knotted on the end.
- All loads will be tied down properly prior to transport by truck, train or other means of transportation.
- All winch hooks and headache balls will be inspected daily prior to use. Hooks without a properly working positive safety latch will be removed from service.
- Truck drivers will comply with speed limits posted on highways and lease / ranch roads. Don’t assume that any truck driver understands exactly what you want him to do. Take the time to explain carefully and give specific if not written instructions.

Taglines

(29 CFR 1926.550 Subpart N and MSHA Part 56.16007)

- Personnel involved in material handling will work all loads with a tagline.
- Taglines will be attached to the end or corner of a load before it is lifted.
- Taglines will be constructed of sash cord, half-inch rope or 1-inch nylon strap and free of knots or hooks. Sisal rope or soft line is prohibited.
- Chains, cables and fall protection lanyards will not be used for taglines.
- Taglines will not be wrapped around the hand, wrist, waist or any part of the body.
- Taglines will be of sufficient length such that no part of the person’s body will be under the load at any time.
- Personnel will not stand on or in the eye of a tagline.
- A snub line from the load to the tail of the truck may be used in lieu of a handheld tagline to minimize swinging while transporting a load across location.
- Personnel are considered to be standing under a suspended load if close enough to touch the suspended object with their hand while it is above the waist.

Fuel Supply and Transfer

(29 CFR 1910.178 Subpart N)

- All bulk fuel supply trucks will be fitted with a bonding/grounding strap between the truck and the fuel storage tank. The truck will be chocked and grounded prior to fuel transfer. A catch bucket will be placed under the transfer pump and hose connections.
- All fuel supply equipment, including hoses, fittings and valves, will be inspected prior to transfer. Only matching fittings with good rubber gaskets will be used. Tank vent plugs will be clear.
- Fuel truck drivers will comply with all PPE standards to include wearing of hardhat, safety glasses, shirts, long pants and foot protection.
- A safety observer will be positioned near fuel transfer operations with a fully charged fire extinguisher for emergency response until the fuel transfer is complete. A safety observer will not leave the fuel transfer until the transfer is completed, secured or relieved by a qualified replacement.
- Tank readings will be taken regularly during transfer to prevent overflowing the fuel storage tank.
- Upon completion of fuel transfer, the hose will be drained in a bucket to prevent spillage.
- Any overflows or spills will be cleaned up promptly to eliminate slip hazard and minimize environmental damage.
- Fuel transfer operations will be stopped upon observing a leak. Transfer operations will not continue until the leak is repaired or eliminated.
- Gasoline powered transfer pumps will not be used to transfer fuel from truck tanks to rig storage tanks or into truck tanks.
- Explosion-proof electrical pumps may be used to transfer fuel or other flammable products.
- Fuel truck drivers will remain with their truck during fuel transfer operations.
- All smoking (including in designated smoking areas within 150 feet of fuel transfer area) will be temporarily suspended during fuel transfer operations.
- Fuel tank levels will be determined using sight-glass tubes and/or flashlights. Fuel tank levels will not be determined using a cigarette lighter, match or any other open flame as a source of light.
- Hoses used for fuel transfer will be fitted with factory-installed crimped end connections. King nipples, boss fittings and field installed end connections secured with wire, worm gear clamps or banding material are prohibited.
- Upon completion of refueling a forklift or other rolling stock, the person performing the task will ensure the isolation valve between the tank and the supply hose is fully closed and the hose and nozzle are properly stored.

SAFE WORK PRACTICES

BACK/LIFTING SAFETY

When lifting or moving loads, personnel shall assess the weight, bulkiness of the item and the route of travel. Proper lifting techniques should be used. When the load is too heavy for one person to lift, the employee shall ask for assistance or use a mechanical lifting device. Below are proper lifting techniques for employees to utilize:

- Keep feet apart – one alongside and one behind the object to be lifted. Feet should be comfortably spread to give stability.
- Keep back arched. An arched back means the spine, back muscles and body are in correct alignment.
- Grip the object with the whole hand, both the palm and fingers. Keep elbows and arms tucked to side of body. This reduces fatigue in chest and arm muscles and is the position where the most power can be generated for lifting. This position also helps control the center of gravity of the body.
- Keep head high and chin tucked in.
- Keep body weight (center of gravity) directly over feet. Start the lift with the thrust of the foot behind the object being lifted. Lift with legs and bring the load close to the body for the most efficient carrying position. Lift smoothly, without jerking or twisting.
- To raise an object above shoulder height, first lift to waist height.
- To change direction, turn the entire body, including the feet. DO NOT twist body at the waist while lifting.
- Do not carry an object that is too big to see over or around.
- For objects that are too large or bulky to be carried by one person, use proper moving equipment or get help.

Cable, Chain., Rope and Sling Safety

(29 CFR 1926.552 Subpart N and MSHA Part 56.16007)

Inspection Process

- Operations supervisors will maintain manufacturer and third party load test records for all rigging materials in service requiring annual load tests.
- Only qualified personnel shall make inspections.
- Inspect all rigging equipment before each use.
- Cables, wire ropes, shackles, chains, slings, hooks and other devices that do not meet the inspection criteria shall immediately be removed from service. Frayed or damaged nylon slings shall be cut and discarded.

General Safe Working Practices

Employees should utilize these tips for proper cable, chain, rope and sling safety:

- Do not damage machines and any soft surfaces of the load with the lifting apparatus.
- Avoid sharp bends in slings and wire rope, and protect slings from sharp edges and abrasions.
- Avoid sudden jerks when lifting or lowering loads.
- Set loads down on proper blocking – never directly on a sling.
- Do not side load.
- Maintain an angle between the sling and the horizontal greater than 45 degrees to reduce stress on the sling.
- Do not stand or walk under suspended loads.
- Never stand or step over any line that is under stress.
- Do not leave suspended loads unattended at any time. Use tag lines of sufficient length to control the lift.
- Slings not in use must be properly stored.
- Chain hoists and snatch blocks should not be fastened to girts because bending of the girts will weaken the derrick.
- Keep hands, fingers, feet and other body parts from between the load line or sling and the load. Do not attempt to guide a load with hands on the sling.

Rigging Equipment

- Know (and reference) the safe carrying capacity of sling chains, wire rope, hoists and other lifting apparatus and do not overload them.
- Immediately discard defective lifting equipment.
- Do not tie knots in sling chains, rope slings or wire cables to shorten them. Knots may decrease the rating of a line or cable by as much as 60%.
- Do not place bolts or other material between links of chain to shorten or splice it.
- Do not lift or hoist any object of unknown weight.

Shackles

- Never replace the shackle pin with a bolt. Use only the proper size-fitting pin.
- Never use a shackle if the distance between the two eyes has spread to where the original pin can no longer be used (i.e. the shackle bolt cannot be threaded so that it makes contact with all thread surfaces provided in the eye).
- All pins must be straight and all screw pins must be completely seated.

- Destroy all shackles that are worn in the crown area or pin by more than 10% of the original diameter.
- Do not use a screw pin shackle if the pin can roll under the load, unscrew and release the load.
- Shackle pins should be secured with safety wire to prevent the pin from unscrewing, especially when in the derrick or in other overhead work.
- Bolt Type Anchor Shackles (BTAS) should be used to secure all overhead equipment such as hoist sheaves.

Rigging of Wire Rope Clips

- Be sure to use the proper number of wire rope clips when attaching, and make sure they are placed so that the U-bolt is on the short or "dead" end. The saddle should be placed on the long or "live" end. ("NEVER SADDLE A DEAD HORSE") **Refer to Exhibit II.**
- Wire rope removed from service will be destroyed to prevent further use. Used wire rope will only be used for stripping drill pipe when it is placed inside of a bolstered tubulars basket. Used wire rope will not be used on standard drill pipe racks.
- Wire rope clamps or factory-poured swedges will be used to create an eye in wire rope rigging.
- Wire-rope clamps should be properly sized, torqued and spaced for the diameter of the wire rope used.
- Flemished, plaited eyes will not be used on any wire rope rigging.
- Protruding tails or bitter ends of wire rope strands on slings and bridles will be taped or blunted.
- Wire rope will be removed from service and not be used if there are (10) broken wires in (1) rope lay or (5) broken wires in any strand.
- Wire rope will not be used if it shows signs of excessive wear, corrosion or defect.

Diameter of Rope (Inches)	Number of Clips	Distance Between Clips
7/16" Or less	2	2-3"
1/2" - 5/8"	3	3-4"
3/4" - 1"	4	5-6"
1-1/8" - 1 - 1/4"	5	7-8"
1 3/8" Or larger	6	9 "

APPLICATION OF WIRE ROPE CLIPS



Correct Method – U-bolts of clips on short end of rope.
(No distortion on live end of rope.)



Wrong Method – U-bolts on live end of rope.
(This will cause mashed spots on live end of rope.)



Wrong Method – Staggered clips: Two correct and one wrong.
(This will cause a mashed spot on live end of rope.)

Exhibit II

Compressed Gas Cylinders

(29 CFR 1910.101 Subpart H and MSHA Part 56, Subpart L)

All compressed gas cylinders shall be handled, used and stored in accordance with the HS&E Handbook and state and local regulations.

Employees should utilize these tips for proper handling of compressed gas cylinders:

- Do not accept damaged cylinders.
- Keep protective caps on cylinders when not in use.
- Keep cylinders away from direct flame, heat and sources of ignition.
- Properly secure cylinders at all times. During movement, avoid rough handling, the striking of cylinders and observe all USDOT requirements (i.e. labeling, manifest documentation, etc.).
- Cylinder contents must be properly labeled. Reject cylinders and return to vendor if not properly labeled.
- Close all valves when not in use.
- Cylinder valves must have a handle or other shutoff mechanism in place while in use.
- Regulators are to be removed from cylinders when not in use unless the regulator is designed to be capped or the cylinders are in an approved welding cart.
- Discharge leaking cylinders outdoors by opening the discharge valve slowly one fourth of a turn.

- Use proper lifting methods/devices (i.e. cradles) for cylinders. Do not lift by the valve or protective cap. Ropes and slings are not to be used for lifting cylinders.

Using Cylinders

- Never use a cylinder of compressed gas without a pressure reducing regulator connected to the cylinder valve.
- Always close the cylinder valve before attempting to stop leaks.
- Do not use oil or grease as a lubricant on valves or attachments to oxygen cylinders.
- Threads on fittings must correspond to cylinder valve outlets.
- Check valves/flare arrestors are to be utilized on fuel gas/oxygen systems.

Storing Cylinders

(MSHA Parts 56.4601, 4602, 16005 and 1600)

- Store cylinders in an upright, secured position.
- Do not store oxygen cylinders within 20-ft. (6 m) of combustible materials or fuel gases unless divided by a 5-ft. (1.75 m) fire resistant wall rated for one half-hour.
- Store empty and full cylinders separately.

Fire Prevention and Protection

(29 CFR 1910.155 Subpart L and 1926.150 Subpart F and MSHA Part 56, Subpart C)

Fire Prevention Guidelines

- Class A fire materials (paper, wood, rags, etc.) should be minimized in process areas.
- Buildings in which flammable or combustible liquids are being used must be well-ventilated at all times.
- Any fire extinguisher found discharged during monthly inspections will be removed from service and replaced immediately. The supervisor will be notified immediately upon finding a discharged extinguisher.
- Access to fire detection and firefighting equipment will be kept clear at all times. Equipment will not be obstructed with pallets, tarps, mud sacks, tools, etc.
- Smoke detectors will be present and in good working order in every living quarter/trailer. Detectors will be tested every 6 months.
- Perform required atmospheric monitoring prior to and during operations that involve opening hydrocarbon vessels or tanks. Use “snoop” suds or intrinsically safe gas detection meters when testing for gas leaks on connections. Never use an open flame.
- Use only approved cleaning solvents.

- Transport of Class II flammable liquids (such as gasoline, diesel fuel, or mixed fuel) shall be done in approved safety cans with the contents clearly labeled.
- A safety can will mean an approved container of not more than 5 gallons capacity, having a spring-closing lid, spout cover and designed to safely relieve internal pressure when subjected to heat or flame.
- Never place portable safety cans inside passenger compartments of vehicles.
- When transferring flammable or combustible liquids from barrel, tank, line or vessel to another container, the source container and the receiving container must be electrically bonded to prevent ignition due to static electricity. Plastic cups/buckets must not be used for collection of hydrocarbon samples.
- Flammable liquid containers or aerosol cans are to be stored in flammable storage cabinets. If opened containers will not fit in the flammable storage cabinet, then remaining product must be used or appropriately discarded.

Fire Response Procedures

(MSHA Part 56.4330)

In the event of fire, the following procedures must be used:

- The first two minutes of a fire are the most critical for extinguishment. Assess the situation and **SUMMON HELP**.
- Initiate Emergency Shut Down (ESD) and/or activate alarm systems if available, evacuate and then secure the area. If working on a rig, the Driller or Tool Pusher will sound the rig alarm/horn to notify everyone on location of a fire.
- Only trained personnel are qualified to operate fire extinguishers and equipment.
- Never fight a fire if the cause or source is not known, or if it is beyond the initial stage.
- Give direction to third party firefighting agencies.

Fire Fighting Procedures

(MSHA Part 56.4330)

- Locate the firefighting equipment.

Note: When activating a cartridge-type fire extinguisher, an employee should point the fill cap away from self or others.

- With the wind at the employee's back, approach the fire and discharge the extinguisher at the base of the fire, sweeping the blaze while advancing.
- After the fire is extinguished or if unable to extinguish, back away facing the fire. An employee should never turn their back on a fire. Stand-by to ensure that an extinguished fire remains extinguished and there are no flashbacks.
- After discharging or using a fire extinguisher, return it for maintenance and recharging.

Iron Sulfide



- Iron sulfide is a material capable of spontaneous combustion when exposed to air. Often combustion occurs on the ground or inside structures such as columns, vessels, tanks, piping, and exchangers. Iron sulfide fires commonly occur during shutdowns, or construction activities when equipment and piping are opened for inspection or maintenance. Iron sulfide can ignite nearby flammable hydrocarbon-air mixtures.
- Deposits of iron sulfide are formed from corrosion products and may accumulate throughout a structure. Before carrying out any maintenance, construction, or similar work activities, a safe work procedure addressing iron sulfide shall be developed, communicated and implemented where iron sulfide is likely to occur. This procedure may be addressed as part of the Job Safety Analysis (JSA). Procedures shall address:
 - Removal of the combustibles (if possible); and,
 - Removal, neutralization or wetting of iron sulfide deposits; or,
 - Removal of oxygen, so that fire is unsustainable (i.e. nitrogen purging).
- Steaming, water washing; blinding and chemical injections (i.e. acid cleaning, chelating solutions, or oxidizing chemicals) are all control methods which should be evaluated prior to the start of work. Scraps and debris (such as filters) collected from structures must be kept wet or otherwise controlled to prevent fire during transportation.

Note: Introducing fresh air into a vessel/piping via air-movers may enhance the combustion process, thus igniting flammable hydrocarbons. An evaluation for iron sulfide shall be made and a Hazard Analysis should be completed prior to the start of maintenance, construction or similar activities in areas known to contain iron sulfide.

Hand Tool and Power Tool Safety

(29 CFR 1910.242 Subpart P and 1926.300 Subpart I and MSHA Part 56, Subpart M)

- Tools will be used for their intended use only. Employees are expected to take the time necessary to get the correct tools.
- Tools will be inspected before using them. Tools that are in an unsafe condition will not be used. Unsafe tools will be reported to a supervisor immediately for timely repair or replacement. Only tools that are clean and in good condition will be used.
- Hammers, chisels, derrick pins, bars or similar “driving”-type tools will not be used if mushroomed or cracked. Striking tools will not be used on mushroomed hammer unions until cleaned up with a file or until the hammer union is removed from service.

- Any hammer or axe with a cracked handle will be immediately removed from service. The handle will be replaced prior to returning the tool to service.
- Purpose-built pail lid removers will be used for removing lids from 5-gallon containers. Pocketknives and utility knives will not be used for this purpose.
- Pipe wrenches with worn heels or jaws and/or bent handles will not be used. Worn heels and jaws will be replaced prior to returning the tool to service.
- Power tools with cut or damaged cords/plugs will not be used until the cord or plug is repaired or replaced.
- Power tools will be properly grounded or manufactured with double-insulated casing.
- Power tools with trigger-locking devices that provide continuous operation are permitted, provided turnoff can be accomplished by a single motion of the same finger used to turn power on. This applies to portable drills and grinders with disks greater than a 2- inch diameter.
- If fitted with an “on/off” switch, a power tool will not be plugged into its power source until the switch is first verified to be “off.”
- Guards will not be removed from portable grinders. Handheld disk grinders without manufacturer-installed guards will not be used. Grinders shall not be used if guards are missing.
- Grinders will be fitted with disk rated at proper speeds. The rated speed of the grinder must not exceed the speed of the grinding disk.
- Grinder disks must be suited for the material to be ground. Do not grind wood with disks intended for metal objects.
- Hand-held grinder disks should be a quarter-inch or thicker. Worn or damaged disks will be replaced immediately.
- Clamps or vises will be used to hold all work dressed by handheld power tools. Employees will not attempt to hold the work using their free hand or a foot.
- Bench grinders without protective shields and adjustable tool rests will not be used.
- Bench grinder tool rests will be adjusted to one eighth-inch from the face of the grinding wheel.
- Grinding on the side of a bench-mounted grinding wheel is prohibited. The side of a grinding wheel shall not be used for grinding unless the equipment and wheel are designed for such use.
- A face-shield will be worn over standard safety glasses by anyone operating or standing near the flying debris from a portable or bench-mounted grinder.
- All adjustments to a portable grinder or other hand tool will be made before plugging the tool to its power source. No adjustments will be made without first unplugging the cord (i.e. to install a new grinding disk or to replace a drill bit in a hand drill).
- Electrical power tools will be secured by unplugging from the power supply, then wrapping up the cable. An energized extension cord or cable shall not be wrapped up.

- Hearing protection will be worn when operating electrical and air-powered hand tools.
- Pneumatic tools with trigger-locking devices that provide continuous operation are permitted, provided the hand tool is also fitted with a positive holding accessory. If the hand tool does not have the hand-hold device, the tool must be fitted with a constant pressure control switch that will shut off when pressure is released.
- Air pressure will be bled off any air-powered tool prior to disconnecting the hose.
- Air supply hoses will be properly pinned with a keeper pin at all crow's foot connections and safety cable between hose and air supply.
- Air supply hoses will have a safety whip check (lanyard) on all quick-connect lines that is properly sized to prevent the hose from whipping in the event a quick-connect parts.
- All power tools will be unplugged or removed from their air supply upon completion of work.
- All power tools will be unplugged or removed from their air supply prior to making any adjustments to the tool.
- Tools connected to a power source will not be left unattended.
- Compressed air outlets and hoses for air-powered (pneumatic) tools will not be pointed at another person or used to clean off boots or clothing while they are being worn.
- Maintain high standards of orderliness by returning tools to their proper storage place. Tools shall not be left lying about.

Job Safety Analysis

(29 CFR 1910.132 Subpart I)

A Job Safety Analysis (JSA) is a way of studying a job in order to identify the hazards or potential accidents associated with each step of the job and to develop solutions that will eliminate, nullify or prevent such hazards. A JSA can help identify and eliminate potential accident causes. It is the responsibility of operations to develop and maintain JSA lists.

JSA Steps

There are four steps to doing a JSA:

1. Select the job to be analyzed.
2. Break the job down into steps.
3. Identify the hazards or potential accidents that could happen.
4. Develop measures to eliminate hazards.

Select the job to analyze

There are many jobs and job positions that can be hazardous to perform. To narrow the list of those that require a JSA, an employee should consider the following items to determine which to do and in what order:

- Job accident frequency – jobs that have a history of accidents are good candidates for a JSA. It is a good assumption that if a job has produced many accidents in the past five years, it is going to continue to do so.

- Job injury severity – jobs that have provided serious injuries are potential JSA candidates.
- Potential injury severity – some jobs have no injury history but have the potential to produce severe or crippling injuries or death.
- Newly established jobs – changes in tools and equipment or new machinery create new hazards, and as such are natural candidates for a JSA.
- The JSA will document the hazards and safe procedures associated with the operation hopefully preventing an accident.

Break the job down into steps

The major reason for breaking the job down into steps is so that each step can be examined for hazards and the potential for accidents. It permits the analysis to be done systematically, one step at a time; in the order the job is done. Each step in the job process tells generally what must be done. (Use active verbs – remove, position, tighten, etc.). The details are omitted. Hazards are not listed in this process, nor are any safety precautions.

Identify the hazards (Potential Accidents)

Once the job is broken down into steps, each step is studied for hazards or potential accidents. The job is to identify all the hazards, whether they are part of the job environment or surroundings, or one of the worker's own doing. Record those hazards that are present or may occur as the job is performed. One of the best ways to identify job hazards is to observe the jobs as they are done.

Employees should ask questions similar to these as the task is being observed (this is a partial list, each situation may suggest others):

1. Could the worker be struck or make contact with anything?
2. Could the worker strike something or fall in any way?
3. Could an exposure or overexposure occur to any condition such as gas, heat, fumes, etc.?
4. Could a strain or overexertion occur?

Develop measures to eliminate hazards

Once all the known or observed hazards are noted, a solution should be developed for each hazard. Solutions may take any one of the following forms:

1. Job procedure solution – spell out exactly what workers are to do to accomplish the task safely.
2. Job environment solution – change some aspect of the environment to make the job safer.
3. Radical solution – a combination of the two above, but an entirely new way to do the job.
4. Reduced frequency solution – find a way to reduce the amount of repair, cleanup, wear, etc., to reduce the amount of times the task is done.

Sandblasting

(29 CFR 1910.94 Subpart G – Ventilation and MSHA Part 56.610)

- Hose operators will wear blasting hoods with an outside air supply. Keep the eye shield clean and free of dust, fog, etc.
- Gloves, long-sleeve shirts and proper foot protection with foot guards must be worn while sandblasting.
- Never use a sandblaster without an assistant to watch the valves and hoses.
- Workers assisting with sandblasting must also wear proper protection.
- If sandblasting where a fall hazard exists, safety harnesses and lanyards must be worn and used.
- Before using sandblasting equipment, personnel must make certain that air hose couplings are safety-clipped together. Air supply hoses will have a safety whip check (lanyard) on all quick connect lines that is properly sized to prevent the hose from whipping in the event a quick-connect parts.
- Point the nozzle at the object to be blasted. Bleed the air pressure off the lines before breaking the hose.
- The nozzle shall have a fully functional dead-man switch that has not been disabled.
- Protect rotating equipment from sand intrusion.

Severe Weather Response

- For rig operations, the DTC Supervisor will shut down normal operations when the threat of lightning is imminent. The derrickman will come out of the derrick and all personnel will take cover in the top dog house or other covered shelter.
- All personnel will keep clear of all wire trays, cable entries and other electrical equipment inside the covered shelter.
- All personnel will secure normal operations and leave the work area, i.e. rig floor, to take cover in the lowest area possible (ditches) upon seeing an approaching tornado. Personnel will stay out of trailers or other temporary buildings.
- Upon notification of a severe storm and/or tornado, all normal operations will be suspended and work area will be made ready for severe weather.
- If the employee is required to respond to an emergency situation during adverse operational or weather conditions, they will exercise due caution and maintain communications with supervisory personnel or control center.
- All office personnel should refer to the office emergency action plan for exit routes; muster points and additional policies regarding severe weather.

DRILLING, WORKOVER AND WELL SERVICE SAFETY

During drilling, workover or any rig-related operation, the DTC Site Supervisor shall implement the DTC Energy Group HSE Program and will be held responsible for coordinating with the contractor's supervisor(s). The DTC Supervisor will verify that the rig crew and all service personnel are familiar with DTC Energy Group standards, rules, policies and procedures. All visitors to drill sites shall report to the Drill Site Supervisor for orientation before access to the site is permitted. The contractor and their supervisors are responsible for implementing the safety requirements of their company as well as DTC Energy Group's standards. Any conflict with DTC Energy Group standards or policies shall be brought to the attention of the drilling supervisor.

General Precautions

- All personnel working on DTC Energy Group locations shall use all required safety devices, safeguards and personal protective equipment.
- All vehicles other than authorized service vehicles will be parked by backing into a pre-designated area located a minimum distance of 150 ft. from the well bore.
- Rig floor must be kept clean and clear, with all tools orderly racked or stored.
- Mechanical rig equipment must not be repaired unless all power is shut down and Lockout/Tagout procedures have been implemented.
- When erecting a rig, personnel must maintain a clearance of at least 10-ft. from high-voltage lines. This clearance allows for guy wires, lines, tubing, etc.
- Every employee working more than 4-ft. above floor or ground level shall wear an approved fall arrest system (Refer to Fall Protection Std.) and will be tied off to a substantial anchorage.
- Repairs to rig components are to be performed with OEM replacements and not "like parts."

Rig Inspections

Daily walk-around inspections of operations equipment by the DTC Site Supervisor or Representative are necessary in order to maintain a safe operation. These inspections shall be done daily. The rigsite manager or designated supervisor shall perform the inspections around the rig. Any unsafe condition should be reported and corrected as soon as possible. The Rigsite Manager will report any conditions which cannot be corrected immediately to the Rig Manager or higher management if necessary. Potential hazards that cannot readily be corrected by rig site personnel should be reported to the immediate supervisor. The supervisor will then initiate the necessary corrective action. Rig inspections should become part of every crew member's daily walk-around routine for detecting and remedying any unsafe conditions.

Rig Floor Safe Practices

While ascending or descending the derrick ladder, employees must utilize both hands to climb using 3-point contact and appropriate fall protection per Fall Protection Safety Standard.

- Hand tools shall be sent up using a tag line or basket to anyone working in the derrick.
- Hand tools shall be secured to the person's harness by a 3-ft. lanyard.

- The rig floor will be clear of personnel whenever anyone is using hand tools in the derrick. Hand tools should be sent down as soon as the job is completed using a tag line or basket.

Note: Tools should not be dropped and at NO TIME should a tool be thrown!

- When picking up or laying down pipe, rods, pumps, etc., with elevators, the back of the elevators must be down with the door opening between the links.
- When picking up or laying down pipe, a sling shall be used.
- Only properly trained employees shall use a hydraulic hoist. An experienced person shall be at the controls at all times during lifting operations.
- All power on hydraulic tongs shall be shut off when making repairs or adjustments. Refer to Energy Isolation (LO/TO) Safety Standard.
- Chain hoists and snatch blocks should not be fastened to girts because any bending of the girts will weaken the derrick.
- All sheaves in the derrick should be inspected and greased regularly.

Raising or Lowering the Derrick / Scoping Out/In The Derrick

- All loose equipment and cables will be secured to the derrick prior to raising or lowering. Sisal cord or soft-line is inadequate for securing objects in the derrick.
- Personnel working aloft in pin/un-pin derrick sections will keep all hands, tools and derrick pins tied off with ropes, sash cord or cable. Areas under the work will be cleared of all personnel and roped-off/taped-off to warn others.
- All loose tools and equipment that could fall as the derrick is elevated or lowered will be removed from the derrick prior to raising.
- The Rig Manager/Toolpusher and Driller will inspect all legs, braces, girts, working platforms and line configurations prior to raising the derrick for potential hazards, proper construction, potential dropped objects and signs of damage or fatigue. They will also inspect all derrick hoisting equipment, pins (all rigs) and outriggers. The Rig Manager/Toolpusher will also inspect hydraulic system for raising and lowering the derrick and outriggers.
- No one will stand under or immediately adjacent the derrick or rig floor while raising or lowering the derrick or rig floor.
- All personnel on site will maintain a safe buffer zone of 30-ft. from the rig while raising or lowering the derrick.
- Personnel will approach the rig after raising only after approval of the Rig Manager / Toolpusher.
- The rig crew will monitor all lines around the rig to ensure they do not become fouled while raising or lowering the derrick. Anyone observing a hazard has the authority to call emergency STOP until the hazard is corrected.

- No one is permitted to ride the derrick as it is being raised or lowered.
- Sheaves mounted in the derrick will be attached to the derrick using a screw-pin or bolt-type anchor shackle. Tie-wraps or cotter keys will be used to secure shackle pins.
- All keeper pins and ears will be inspected prior to raising or lowering to ensure no hazardous conditions exist.
- All derrick and sub-base pins will be fitted with closed keeper pins. Welding rods will not be used as keeper pins in derrick pins.
- The derrick stand(s) will be kept in place until the derrick is secured in a vertical position.

Air and Hydraulic Hoist Operations

- Personnel will not stand between the hoist and the load.
- Operators will always stand behind the hoist with one hand on the line guide and the other hand on the hoist controls (except if using a pendant control to maintain line of sight).
- Hoist operators will not leave the hydraulic hoist any time equipment or personnel are elevated.
- Hoist will be equipped with wireline guides and guards around the wireline spool.
- The hoist throttle will be operated at a slow, steady rate and returned to the neutral position when release by the operator. Line will be spooled evenly using wireline guides.
- The hoist drum brake will be set any time the load or a person is stopped in suspension.
- A single, designated flagger will be used to maintain visual contact between the load and the hoist operator.
- The hoist line will be secured to a stationary object upon completion of all hoisting.
- Hoist exhausts will be routed through the rig floor to reduce exposure to high-noise hazards. Exhausts will be secured and directed so as not to present a danger to personnel working below.
- Hoist will not be operated in neutral position allowing free-fall of the load or personnel.
- Hooks and hoisting equipment will be visually inspected prior to each use for cracks, excess wear or damage. Hazardous rigging will be taken out of service and destroyed. Lines “bird caged” on the drum will be corrected and visually inspected before lifting any loads or personnel.
- Snatch blocks or sheaves will be used to change the direction of pull on a hoist. Routing the hoist line through a shackle or over a beam is prohibited, as this produces excess wear on the wire rope.
- The working end of the hoist line will be fitted with a thimble eye and shackle. Factory-made eyes are required for hoisting personnel and are preferred over field-made eyes for lifting equipment.
- Field-made eyes will consist of a minimum of three (3) cable clamps, spaced 5-7 times the diameter of the wire rope.

- “Sureloc”-type hooks with outward opening latch and release trigger on backside of hook will **not** be used for material handling activities.

Stringing Up the Blocks

- Personnel will wear gloves while handling the drill line.
- Personnel will stand clear of the drill line whenever it is being pulled by the drawworks.
- Personnel standing on the crown to feed the drill line around the crown sheaves will maintain 100% fall protection.
- Personnel will keep hands clear of the sheaves and drawworks drum during string-up operations.
- The crown-o-matic/twin-stop will be tested upon completion of stringing-up or stringing-back while the derrick is in the raised position.
- Only the Rig Manager/Toolpusher, Driller or Assistant Driller (under direct supervision of the Driller) will operate the rig drawworks during stringing-up operations.
- Personnel will not climb inside the drawworks drum guard until the source of power to the drawworks has been secured, locked-out, tagged-out, tried out and chained down.
- The deadman anchor and drilling line clamp will be properly secured and torqued on both ends of the drilling line per manufacturer’s instructions. The Rig Manager/Toolpusher or Driller will inspect the clamps after final installation.
- A pipe bar will be used to guide the drill line on the drawworks drum grooves. Personnel will not place hands close to the drum to guide the drilling line.

Mud-Mixing Operations



- Employees, contractors and vendors must wear the correct personal protective equipment (PPE) at all times while mixing chemicals, which may include, but not limited to hardhats, safety glasses with non-ventilated chemical goggles, dual cartridge respirators, aprons and rubber gloves.
- Personnel engaged in chemical mixing operations will not tuck their pant leg inside of their boots while mixing chemicals.
- Personnel will study the MSDS sheet for the proper PPE and emergency response in the event of chemical exposure prior to each mixing operation.

- Caustic soda will be mixed in a caustic barrel. Only one sack of caustic will be added to the barrel at a time. Caustic will not be kicked or dumped through the mud pit grating. It will not be mixed at the mud hopper.
- Caustic soda will be added to a barrel of water. Water will never be added to caustic soda already in the barrel. The presence of water absorbs the heat from the chemical reaction and prevents explosion.
- Handling of empty caustic and/or bromide sacks will be in concordance with the MSDS sheets and will include the wearing of all PPE to prevent exposure.
- When handling or mixing chemicals that creates excessive dust, a dual cartridge respirator will be worn to prevent inhalation.
- Mud agitators will be locked-out, tagged-out and tried prior to entering a mud pit or mud tank for cleaning or repairs. The atmosphere in the pit/tank will also be checked for sufficient oxygen, explosive gases and toxic gases using a portable gas detector per Confined Space Entry procedures.
- There will be no eating, drinking or smoking in mud-mixing areas because of the potential to ingest harmful chemicals and potential for fire. Food products will not be stored in containers, lockers or plastic bags that also contain respirators or other potentially contaminated PPE in the mud-mixing area.
- Personnel will not put their head over the mud-mixing hopper in the event chemicals blow back out. Extreme care should be taken when unplugging a hopper.
- The intake pump to the hopper will be turned on first at the start of mixing operations to ensure there is not trapped pressure and to prevent mud products from being blown out of the hopper.
- Mud mixing areas will be cleaned and organized up upon completion to remove slip, trip or fall hazards.

Mud Pump Operations and Repair

- Mud pumps will be fitted with a relief valve (pop-off) to protect the pump and discharge lines from extreme pressure caused by valve failure, plugged bits or incorrect valve lineup. The pop-off should have the correct shear pin in lieu of nails so the valve will discharge at a pressure below the maximum allowable working pressure of the pump.
- There should be no 90-degree turns in pressure-relief lines from the mud pump. Relief lines will be anchored and hard piped. Any turns that are required must be targeted T's.
- There will be no valves positioned between the pump discharge and the pop off.
- The driller will be notified before working on any mud pump. The power supply to the pump will be locked-out/tagged-out/tried to prevent accidental start-up of the pump during maintenance or repairs.
- The valves in the discharge manifold that connect the fluid system with that of another pump will be closed, locked and tagged to isolate the pump before work is performed.
- Personnel will verify that all pressure has been bled off the pump before starting any maintenance or repair.
- The preferred method for lifting mud pump liners will be with a hoist, chain fall or some other mechanical lifting device.

- Personnel will not place their hands or fingers inside the pump's rod chamber with the pump in operation. Additionally, metal bars, wooden boards or other types of prying devices will not be placed on the pump's open-rod chambers while the pump is running.
- The mud pump oiler will not be repaired or adjusted while the mud pump and oiler are operating.
- Personnel will account for all tools following a mud pump repair or maintenance and prior to removing any lock-outs (example: jack shaft wrench). All tools will be checked in and out.
- Water hose streams and paint spray nozzles will not be directed at the pump's electric blower intake when cleaning the pump(s).
- Pulsation dampeners will be recharged with nitrogen only. The use of oxygen is prohibited.
- Proper lifting techniques will be used for handling mud pump repair parts. Personnel will avoid twisting by rotating their feet while manually handling loads.
- High-pressure mud system hoses (>1000 psi) will be safety cabled with factory made cables. Chains should not be used for this purpose.
- The top of mud pump piston pots will be safeguarded with purpose-built guards to prevent access to operating machinery and retain any flying debris in case of liner failure.

Wireline Survey Operations

- Only trained, qualified operators will operate the wireline machine.
- Personnel will keep their hands on guide handles only. All wireline machines will be equipped with guide handles and depth counters.
- Personnel will not wear loose clothing near the wire-line spool.
- The wireline spool will be operated at a slow, controlled speed.
- Rags will not be used to remove drilling fluids from the wireline.
- Wiping rubbers, hoses, ropes or other materials will be secured to a fixed object so as to avoid hand pinch points.
- Sheaves used to route the wireline will be compatible with wireline size.
- Sheaves will be securely anchored with tie wraps or cotter keys in the shackle pin and safety chained to prevent free-falling objects.
- Drill crew members will reduce the operating speed of the wireline machine 500 feet prior to the tool reaching the surface.
- Pump down head will be removed from the stump when the tool is 500 feet from the surface under normal operations.

- The wireline size will be checked for suitability prior to lifting or pulling directional tools.
- Vise grips will be used to hold the wireline when cutting so as to keep hands out of danger.
- Personnel engaged in cutting wireline will remove excess slack immediately to prevent whipping or slashing upon cutting wireline.
- Barrier/danger tape will be strung prior to the start of wireline surveys to keep personnel clear of potential hazards.

Slips and Elevators

- At least two persons should be used to lift the slips.
- Slips should be maintained with sharp dies at all times.
- Safety goggles and gloves must be worn when changing slip dies.
- The tapered sides of slips should be lubricated for easy removal from the bushings.
- Slips should not be kicked into place.
- Slip handles should be maintained to original manufacturer's specs and replaced with original parts.
- Flexible slip handles and dumbbells on tongs are recommended to prevent potential hand injuries.
- Elevators should be maintained in good working condition.
- Personnel should check for extensive wear on the latches, latch springs, hinge pins, elevator shoulders and hobble clamps.
- Riding the elevators or blocks is prohibited.
- When latching elevators onto pipe in the rotary, one person should pull the elevators back away from the pipe on the back of the elevators as they are lowered. The handle should not be pulled down, as this will cause the elevators to close prematurely.
- As the elevators reach the "latch on" level of the pipe, the horns should then be grasped to pull elevators toward the pipe for latching.
- The person behind the rotary must release grip on the elevators as they begin to swing inward and place hands approximately 18 inches up the elevator bales or links, and then push to assist in latching the elevators onto the pipe.
- Personnel should never attempt to use the eyes of the bales to grab on and push because the elevators can be bumped riding up and injure the hands.



Handling Tubular Goods

- Tubular goods should be adequately chocked with wooden blocks or other suitable materials on level racks.
- When moving tubular goods with a hydraulic hoist, lifting lines should have two wraps around the drill pipe with the hook facing downward.
- Personnel should not walk between or beneath tubular goods that are being hoisted.
- Personnel should always roll pipe from the ends in case the pipe gets out of control. Pipe racks should be worked from the ground at all times.
- Pipe racks should be kept level and in a safe and orderly condition.
- Flagging signals should be used when moving pipe with cranes and hydraulic hoists if the operator's view is blocked.
- Tail or tag lines are required to maintain good control when lifting loads or moving drill pipe.
Note: Knots should not be tied on the ends of tag lines because the line could get hung up between objects. This could create a "slingshot" effect to the rope when it is pulled loose by the crane.

Drilling Under Pressure

- Drill crew members should minimize exposure around and over the rotary table while making connections and pulling slips.
- Rotating head operating pressure will not be exceeded.
- Drill crew members will not put their head or body over the slips while pulling.
- Drill crew members will let the Driller pull up on drill pipe prior to grabbing the slips to allow residual torque to be released.
- Drill crew members will coordinate with the Driller and ensure pressure is off the rotating head prior to pulling it or working on or around it.
- Crude oil collecting on top of mud pits will be removed promptly to eliminate potential fire hazards.
- Rotary bushings/bowls will be kept locked while drilling under pressure.

Nippling Up / Nippling Down

- Personnel will remain out from under and between loads.
- On rigs without BOP handling tracks, the BOP stack will be picked-up, snubbed and tailed with proper rigging equipment.
- Lifting shackles will be verified to be of adequate strength before being put into service.

- All pick-up lines, eyes and shackles will be inspected for damage or fatigue prior to lifting BOP components or the entire stack. All equipment will be used properly.
- A flagman will be designated and identified by wearing an orange vest to direct the positioning of BOP winch lines and equipment.
- No one else will give signals to winch operators. All pick-up lines connected to the stack will remain shackled until the flanges have been bolted down.
- BOP's will not be climbed on until they are on the well head flange or the flange of another BOP component.
- Fall Protection will be used if working at heights greater than 4 ft.
- Personnel will keep hands and fingers out from between BOP flanges as they are guided or aligned onto BOP stubs. Taglines and boards will be used to center the equipment over stubs.
- Drill crew members will remain clear of co-workers swinging sledgehammers to tighten or loosen nuts on BOP stubs.
- Crew members swinging a sledgehammer will ensure the area is clear below and behind him.
- All hammer wrenches will be secured with a rope to prevent striking co-workers.
- When hammering BOP bolts and nuts, the correct size tools will be used. The sledgehammer used to strike the wrenches will be the correct size and weight which allows controlled and accurate swinging.
- Hands will not be placed near the hammer wrench when struck by the sledgehammer. Tail ropes will be used to avoid mashing hands or fingers.
- If a section of the BOP is required to be picked up off the lower section in order to install or start the nuts onto the studs, a wooden board will be placed between the flanges and the weight slacked off before placing hands into this hazardous area to start the nuts (i.e. in the sloped section above the bottom flanges of the annular preventer). No personnel will place their hands in this area of a suspended load.
- All BOP nuts will be installed with the hands and fingers on the outer edge of the nut – not placed above or over the top of the nut and/or stud.
- Ensure that the nuts and bolts are the recommended size and in good condition and ready to install.
- Sledgehammers will be stored with the handle lying flat on the ground or floor. Handles will not be left standing up straight.
- Hydraulic lines will be bled to zero pressure before hammering is permitted on hydraulic unions during nipple down. Use Energy Isolation procedure to ensure energized systems are controlled.



Pressure Testing

- Personnel will remain clear of all pressured lines during BOP testing.
- Personnel will not hammer on any testing or co-flex lines until all pressure has been bled off of the line.
- Personnel will not climb on the BOP stack during BOP testing.
- Upon completion of a blind ram pressure test, pressure under the rams must be bled off, HCR valve opened and casing pressure checked before opening the tested rams.
- A pressure gauge will be installed on the choke manifold.
- Baker-lock thread compound will not be used on contractor or service company high-pressure unions.

Top Drive Operations

- Pre-installation, check-out and rig-up procedures will be followed. Visual system inspections will be conducted prior to operational testing.
- All personnel working around and under the top drive will be cleared away prior to operational/function testing.
- Torque tube stabilizers will be secured with a safety chain in the event the stabilizer is struck by the box end of a stand of drill pipe.
- Elevator links will be snubbed off with hoist lines prior to changing out elevators in the event the elevator links kick back due to an air bag leak. Personnel will stand alongside (not in front of) the elevator in case of unexpected movement.
- Hydraulic leaks from the top drive must be corrected immediately so as to eliminate the source of slip hazards around the rig floor.
- All hydraulic spills should be cleaned up immediately and reported to line management.
- Personnel should never wash near the top drive system motors or blowers with a high-pressure sprayer.
- Rig personnel will keep water and paint away from top drive blowers.
- Rig personnel will inspect all tie wires/safety pins daily for signs of damage or wear.
- Service loops to the top drive will be hung clear of other obstructions to prevent chaffing.

Wireline Operations (Logging, Coring, Perforating)

- Only essential personnel will be allowed on the rig floor while radiation sources are being installed in the logging tool, transported to/from the tools or removed from the tools.
- The drill crew and wireline crew will review contractor and DTC safety standards prior to the start of wireline operations.

- The drill crew and wireline crew will prepare or review a written Job Safety Analysis (JSA) prior to the start of the job.
- Only the drill crew will hang wireline sheaves in the derrick per the wireline foreman's direction. All other personnel will remain clear of the rig floor while the sheave is being hung.
- Personnel will not stand under loads while they are being rigged up (e.g., wireline sheaves).
- Personnel will not walk over or near wirelines.
- The stairs next to the v-door will not be used during wireline operations. Access at the top and bottom will be barricaded during wireline operations.
- The rear wheels of the wireline truck will be chocked after it is spotted on location.
- A razor blade on a wooden block or alternative cutting tool will be used to cut primacord. Cutting primacord with crimping pliers or pocketknife is prohibited.
- A shot/perforating gun will not be capped or connected to the wireline during an electrical storm.
- All personnel will remain clear of the operations when the shot/perforating gun is capped and armed.
- Short-out leads will be used when connecting any shot/perforating gun to the wireline.
- The wireline will be isolated from the firing panel until the perforation assembly reaches a minimum depth of 200-ft.
- Under no circumstances will the elevators be removed or left off the drill pipe while it is being torqued in either direction or while the string shot is being fired.
- The wireline will be shorted-out, locked-out and tagged-out at 200-ft. when pulling the expended perforating gun from the well bore.
- All live explosives left in the well bore will be reported to the Operator's representative.
- Rubber gloves and goggles will be worn while handling a chemical cutter before and after firing.
- Only one DTC Representative will be on the rig floor while raising or lowering perforating guns with the wireline. All other non-essential personnel will be removed from the rig floor.
- Welding will not be conducted during perforating operations.
- Signs or designated personnel should be posted at entrances to the location to notify visitors that explosives are in use.
- All personnel not involved in handling the explosives must be alerted to stay away from the work area and out of the perforator's line of fire.
- Personnel must turn off radio and telephone transmitters, welding machines and other electrical power sources located within 500- ft. of perforation operation and not required for handling the explosives and other necessary operations. Prior to loading the gun, the DTC Energy Group Production Supervisor should

notify the supervisors of surrounding facilities that all radio transmitting equipment, including remote monitoring and control devices (RMC), are turned OFF.

- All equipment should be electrically grounded as specified by service company procedures and checks should be made for stray currents. The source of any hazardous stray currents should be located and eliminated.
- The circuit breaker switch on the unit electrical panel will be locked in the open or off position until the perforating gun is in place down-hole and ready to be fired. After firing, the switch will be returned to the open or off position and remain there.
- The top drive will be isolated (locked-out/tagged-out/tried-out) during perforating operations.

Fishing/Jarring Operations

- All non-essential personnel will remain off the rig floor and out from under the sub-base area during jarring operations.
- All personnel will remain clear of the deadline and deadline anchor.
- The drill crew will inspect the derrick, pins, keepers, draw-works and the top-drive frequently during jarring operations for potential falling objects.
- If the rig is equipped with a top-drive, the manufacturer's checklist will be completed before the start of jarring operations.
- The Rig Manager/Toolpusher will inspect the drilling line, drill line clamp and deadline anchor (tie-down) prior to the start of jarring operations.
- The drill crew will inspect the derrick, pins, keepers, draw-works and top-drive upon completion of jarring operation for potential falling objects.

Well Servicing and Stimulation Safety

This section does not attempt to address all precautions needed in every well servicing situation, but instead provides *minimum* basic safety standards of care.

General Precautions

- Each well servicing unit should be equipped with a derrick man emergency escape device.
- Each well servicing unit should be leveled and properly secured using guy wires before work on the well begins.
- Guy wires and safety slide lines should be attached to approved anchors and flag wires and lines at head level for visibility.
- Anchors should be set and tested according to the manufacturer or regulatory guidelines.
- Adequately sized and properly located fire extinguishers must be provided.

- Backpressure valves or tubing plugs must be used when removing the production tree or master valve.
- Use blow out preventers (BOP's) and test BOP accumulators after initial rig up, and then periodically during work over operations as required by DTC Energy, the Operator's desire or government regulations.
- A quick opening, full-bore tubing valve is required.
- The derrickman specifically (or any other personnel) will not ride the blocks up or down.
- No one shall be allowed in or under the derrick while it is being raised or lowered.
- Rig pump and lines should be secured and tested before use.
- A check valve must be installed as close to the well as possible.
- A heat-fusible cap should be placed on the surface safety valve (if applicable) during well servicing operations.
- Barriers and signs should be placed to notify and prevent unauthorized personnel from entering high-pressure areas.
- When pumping heated oil under high pressure, a check valve must be installed as close to the well or flow line as possible to prevent spraying hot oil in case of a line rupture.
- Swabbing or hot oiling operations should only be performed in daylight or where adequate lighting is provided.
- A stripping-type annular preventer should be considered for situations where hydrocarbon releases may be anticipated.
- Situations that should be reviewed are well operations that may be hampered by the inability to fully circulate out hydrocarbon or excessive fluid losses.
- Equipment and personnel should be located as far as practical from the wellhead during stimulation treatments.
- While refilling propane tanks on hot oil trucks on location during hot oil operations, the driver will shut off the main burner, pilot and truck engine.
- The propane delivery truck will maintain a distance of at least 50- ft. from the hot oil truck firebox.
- When pulling polish rod, the stuffing box shall be stripped down to the lower end of the polish rod prior to laying rod down. If the box sticks on the rod and is not freed, it shall be clamped onto the rod so it cannot fall.
- When pulling stuck rods or tubing, the derrick and floor will be cleared of non-essential personnel.
- Pipe, rods or wire line should not be stripped with hands.
- When picking up or laying down tubing, rods, pumps, etc., with elevators, the back of the elevators must be down with the door opening between the links.

INDUSTRIAL HYGIENE PROGRAMS

Hazard Communication

(29 CFR 1910.1200 Subpart Z and MSHA Part 47)

- Each chemical container on DTC site shall have a “Hazard Communication” label on it.
- Original manufacturer’s containers must contain the following information as a minimum on its “Hazard Communication” label:
 - Name, address and emergency contact telephone number
 - Chemical identity
 - Appropriate hazard warnings (and USDOT placarding for shipping containers) with pictures, symbols, colors and words which convey hazards of the chemical
- Temporary use or portable containers must use an NFPA or HMIS labeling format which includes all of the following information on its “Hazard Communication” label as a minimum:
 - Name of the chemical, Hazard Class rankings (Health, Flammability, Reactivity and Special Hazards) as indicated on the chemical’s MSDS
- Exception to labeling – When an employee transfers a chemical to a portable container which is intended for immediate use during that employee’s work shift, a hazard communication label is not required. The container must, however, remain in the possession and control of the employee who made the transfer, and the product content must be identified on the container.
- Material Safety Data Sheets (MSDS) must be accessible for each chemical in inventory on location. An updated chemical inventory list must also be maintained for each location and reviewed annually.
- Before contractors begin work, DTC Energy Group’s Representative will inform contractor of any potential chemical hazards associated with the job or chemicals stored in the affected areas. Copies of MSDS for those chemicals will be made available upon request.
- Third Party contractors and vendors will make DTC Energy Group aware of any potential chemical hazards associated with their work or materials being used on a DTC site or facility. Copies of MSDS for those chemicals will be made available to DTC upon request.

Basic Rules and Procedures for Working with Chemicals

- The MSDS shall be referenced (prior to handling chemicals) for appropriate PPE to protect personnel.
- The MSDS shall be referenced for First Aid response actions following a chemical exposure incident to personnel.
- In case of eye contact with chemicals, promptly flush the eyes with water for at least 15 minutes, remove contaminated clothing and seek medical attention. Emergency eyewash stations or showers must be within 25-ft. of any injurious/corrosive chemical handling areas.
- Spills should be promptly cleaned up as required by the MSDS and/or local, state, or federal guidelines using appropriate PPE and following DTC guidelines. Disposal of all cleanup materials shall be in accordance with the DTC Waste Management program.

- Chemicals or materials that produce flammable or combustible fumes/vapors shall not be stored where there is risk of creating an ignition and/or heat source.
- Transfer of flammable/combustible chemicals from bulk storage containers requires the installation of bonding and grounding connectors to prevent the generation of static electricity.
- When working with flammable/combustible chemicals or where flammable/combustible materials have been stored, non-spark producing tools and explosion-proof lighting shall be used.
- Chemicals should not be smelled or tasted.
- It is prohibited to eat, drink, smoke, chew gum or apply cosmetics in areas where chemicals are present. Wash hands before conducting these activities.
- Glassware or utensils should not be used in laboratory operations to handle food or beverages.
- Food or beverages should not be in chemical storage areas or laboratory refrigerators.
- Chemicals and equipment shall be properly labeled and stored.
- No container should be received, accepted or transported which has been damaged or does not have appropriate labeling.
- Stored chemicals should be examined monthly for deterioration and container integrity.
- When chemicals are hand-carried, the container should be sealed.
- If handling volatiles it may be necessary to have some pressure relief to vent the vapors.
- Incompatible chemicals must not be stored near each other. Refer to the chemical's MSDS for proper storage requirements.
- Spill containment devices such as containment rings or drip pans should be used to contain leaks from containers at transfer areas.

Asbestos

(29 CFR 1910.1001 Subpart Z)

General Asbestos Requirements

- Asbestos-containing material that may be encountered on DTC facilities could include transit siding/roofing, building or pipe insulation, gaskets, floor and ceiling tile, window caulking and pipe coating. These materials are assumed to be asbestos unless documentation and/or testing proves otherwise.
- Before a contractor begins work, DTC Energy Group will inform the contractor in writing of any potential asbestos hazards associated with the job. Contractors shall be licensed in the state in which the work is to be done and shall have a formal ACM removal program which includes job procedures, training, PPE and certifications/license requirements.
- Asbestos products will not be purchased unless non-ACM products are unavailable.

- All asbestos removal (including repair/O&M jobs) will be supervised by a formally trained Competent Person. Only trained and licensed personnel (as applicable to the region) can remove ACM products.
- Eating, drinking, smoking or chewing is prohibited in any contaminated work areas.
- Contact/inhalation with ACM material can be avoided by the use of protective clothing such as gloves, coveralls, rubber boots, respirators and eye protection.
- Personnel should thoroughly wash exposed skin areas, which may have been exposed to ACM before eating, drinking, smoking or chewing.

Benzene

(29 CFR 1910.1028 Subpart Z)

Benzene may be present in natural gas, crude oils and gasoline. Exposure monitoring, engineering controls and personal protective equipment will accomplish the prevention and control of benzene exposure.

- Personal protective equipment (PPE) will be provided for DTC employees to prevent eye contact, limit dermal exposure and minimize the inhalation of vapors. PPE may include impermeable clothing, respiratory protection, chemical resistant gloves, safety glasses with side-shields, splash goggles, splash-proof face shield, chemical-resistant footwear and chemical-resistant apron.
- Employees potentially exposed to benzene levels of 1ppm TWA (8 hour exposure) or 5 ppm STEL (15 minute exposure) will wear at least a half-mask respirator with appropriate cartridges.
- Food preparation, dispensing and eating are prohibited in areas where benzene containing material is handled or exposure exists.
- The use of tobacco products is prohibited in areas where benzene-containing material is handled or exposure exists.
- No skin or eye contact is allowed. If skin contact occurs, employees will immediately wash affected body parts with generous amounts of soap and water. If soap and water are not available, employee should use a waterless hand cleaner. After handling benzene-containing material, it is recommended that hands be thoroughly washed after discarding gloves.
- If clothing should become contaminated with benzene, it should be removed immediately to prevent personal exposure and the spread of contamination to vehicles, offices, shops and homes.
- Rinse the potentially exposed area with generous amounts of soap and water.

Tank Gauging Procedures

Potential exposures to hazardous vapors and explosive gases can occur during tank gauging operations. To reduce the potential exposure, the following safe operating procedure should be followed:

1. Before gauging any tank, review and/or complete the DTC Job Safety Analysis (JSA) for this task (if applicable).
2. Read signage and warning labels to determine if the location is known to contain H₂S or benzene-containing materials.
3. No smoking, open flame or spark-producing equipment (including cellular phones) may be used during gauging.
4. The Fire Retardant Clothing (FRC) Policy shall be followed for protective clothing requirements associated with tank gauging or working in an environment with the potential for flash fire.
5. Determine the wind direction. Stand upwind, as much as possible, before opening the “thief hatch.”
6. Wait a few minutes to allow vapors and gases to vent off.
7. Thief (gauge) the tank.
8. Close the thief hatch.

Hearing Conservation

(29 CFR 1910.95 Subpart G and MSHA Part 62.150)

Employees who are exposed or potentially exposed to a time-weighted average (TWA) of 85 decibels (dBA) or greater over an 8-hour period are deemed to be at risk. All employees are encouraged to annually have audiometric testing performed. All employees should be trained on the effects of noise on hearing, the purpose, types and use of hearing protectors, the purpose of audiometric testing and an explanation of the test procedures and their results.

All DTC Energy Group facilities shall be periodically assessed for continuous high-noise levels (85 dBA or greater). Warning signs shall be posted in areas identified as high-noise level areas. Personnel are required to wear hearing protection in high-noise level areas and during unusual operations. Extremely loud jobs such as blowing down lines or venting of air pressure may require the use of dual protection (plugs and muffs).

Heat Exposure

Signs and Symptoms of Heat-Related Illnesses

Heat Cramps – Muscle cramps of the abdomen, legs or arms.

Heat Exhaustion – Profuse sweating with pale, moist and cool skin; weakness; loss of appetite; dizziness. May also have heat cramps, nausea, urge to defecate, chills, rapid breathing, tingling of the hands or feet, and confusion.

Heat Stroke – Headache, dizziness, stomach pains, confusion, weakness and sudden loss of consciousness, and may have seizures; skin is hot and may be dry; pulse and respiration are rapid and weak. Heat stroke is a medical emergency.

Basic Heat Injury Prevention

To reduce the risk of heat injury, the following procedures should be followed:

- Reduce the risk of heat-related injury by regular consumption of water and clear fluids. When possible, provide cooled water (50°F to 60°F) to promote voluntary consumption. Do not wait until thirsty to replenish fluids (especially when working in hot environments or performing strenuous work).
- Take frequent small drinks of water since they are more effective than drinking a large amount of water all at once. Larger individuals need more water.
- The use of salt tablets for replacement of salt lost through sweating is not recommended. An adequate salt intake is best achieved by eating three salt-seasoned meals per day.
- When possible, schedule heavy workloads for the cooler hours of the day, such as early morning or late evening.
- Give frequent rest periods. Lower the work rate and workloads as the heat condition increases.
- When possible, workloads and/or duration of physical exertion should be less during the first days of exposure to heat, then they should gradually increase to allow acclimatization.
- Monitor the condition of your co-workers closely and encourage them to take action if they appear to be suffering from the ill effects of heat exhaustion.

Heat Stress Monitoring (WBGT Surveys)

Heat stress monitoring using Wet Bulb Globe Temperature (WBGT) meters should be utilized when work factors place excessive heat load on an individual. Heat stress monitoring should be employed to determine stay times and break intervals if excessive heat is a factor. Heat load factors include:

- Ambient temperatures above 105 F° or high humidity above 90% or a combination of the two.
- Moderate to heavy work load (as defined by OSHA Technical Manual – Sect III, Chapter 4: Heat Stress) ranging from 200-500 kcal/hour.
- Wearing of PPE and/or Fire Retardant Clothing (FRC) which reduces evaporative cooling effect.
- Salt tablets as recommended and increased water intake may be used to prevent dehydration.
- Increased work intervals with fewer breaks.

Hydrogen Sulfide

Effects of Hydrogen Sulfide

Hydrogen sulfide (H₂S) can cause loss of consciousness or death at low concentrations and may be present in some DTC operational sites (**Exhibit III**).

Characteristics of H2S:

- Highly toxic, colorless gas.
- Heavier than air.
- Flammable with an explosive range from 4.3% to 46% by volume.
- Corrosive to metals and can also lead to hydrogen embrittlement and sulfide stress cracks.
- Smells like rotten eggs in low concentrations.

Note: Do not rely on the odor to detect H2S since it quickly deadens the sense of smell.

Exposure Effects of H2S

Concentration of H2S in Parts per Million (PPM)	Physical Effect
0.003-0.02	Odor threshold.
Above 10	Prolonged exposure may be toxic.
Below 100	Quickly deadens the sense of smell.
Above 100	Considered Immediately Dangerous to Life or Health (IDLH) by NIOSH.
Above 500	Attacks respiratory center in brain causing loss of consciousness within 15 minutes.
Above 1000	Immediate unconsciousness and death if not revived promptly.

Exhibit III

Detection Devices

Portable H2S monitors must be used to alert personnel who may encounter hydrogen sulfide levels beyond permissible exposure levels. Fixed monitors must be used in areas where hydrogen sulfide is present in high concentrations at or above 100 ppm.

Possible H₂S Sources may include, but are not limited to, changing out meters, blowing down separators, tank gauging, H₂S scavenger units and venting of tanks/vessels.

Respiratory Equipment

Escape units – Designed strictly for escape from a hydrogen sulfide atmosphere.

Self-Contained Breathing Apparatus (SCBA) or Supplied breathing air unit – Generally used as a work unit. Such units must have a positive pressure feature. Supplied air units must be equipped with an escape cylinder in case the air supply is interrupted.

General Requirements

- Detection equipment must be used when working in an area where there is a possibility of hydrogen sulfide gas, especially in enclosed or below-grade areas.
- A hydrogen sulfide area must not be entered without proper training (including CPR) and authorization.
- In atmospheres immediately dangerous to life or health (IDLH level of 100 ppm or greater), a standby person(s) with suitable self-contained breathing apparatus must be available for purposes of rescue.
- Personnel should never attempt to rescue a hydrogen sulfide victim without proper respiratory protection in the form of a Self- Contained Breathing Apparatus (SCBA) or an approved air line unit equipped with an escape pack.
- Iron sulfide deposits are generally found in hydrogen sulfide areas in tanks, vessels and piping. Iron sulfide may spontaneously combust when exposed to air and should always be kept wet to prevent ignition. (See Iron sulfide, under Fire Safety).
- Wind socks need to be used in areas of known H₂S.

Lead

(29 CFR 1910.1025 Subpart Z)

DTC Energy Group has established a guideline to control potential exposures to lead-containing products in its facilities. Employees performing maintenance activities, which can potentially disturb lead-containing products such as paints or coatings, must meet the minimum requirements. An action level of 30 cubic micrograms per cubic meter of air as an 8-hour TWA has been established for lead.

General Lead Requirements

- Before a contractor begins work, DTC Energy Group will inform the contractor of any potential lead issues associated with the job. Contractors shall have their own program, which shall include job procedures, training, PPE, certifications/license, etc.
- Lead-containing products will not be purchased unless products not containing lead are unsuitable.
- Only trained personnel can remove lead-containing material.

- Unknown coatings shall be tested before their removal to determine safe work practices and the appropriate level of personal protective equipment required for the job, (i.e. respiratory protection and protective clothing).
- Qualitative lead test kits should be used for testing paints and/or coatings prior to work commencement.
- Before welding, cutting or hot work, coatings and/or painted surfaces should be removed within 6 inches of the weld area to prevent potential lead from being vaporized by the heat if lead is present.
- Chemical removal methods should be used when applicable to reduce potential exposures.

Naturally Occurring Radioactive Material

Naturally occurring radioactive materials (NORM) can be produced in the course of some oil and gas operations. NORM typically occurs in scale and is found in areas where large pressure and temperature changes occur, water is commingled with different pH or where water and/or particulate is removed from process equipment such as: produced water tanks, separators, coalescers, dehydrators, flow lines, tubing, pumps, filters, etc.

The NORM Management Program shall be followed by all DTC personnel to ensure that facilities are monitored to preclude personnel exposure to NORM at levels greater than or equal to ($>$) 50 micro-Roentgen per hour (\cdot R/hr) above background levels. Minimum requirements for NORM control measures are set forth in the NORM Management Program.

If the presence of NORM is suspected, DTC Energy Group personnel will reference this NORM Management Program which requires confirmatory gamma radiation surveys on the affected equipment in addition to recurrent periodic surveys of DTC facilities. If survey results show gamma radiation levels $>$ 50 \cdot R/hr, (above background), the equipment and/or material shall be treated as NORM-contaminated and special labeling, stowage and disposal procedures of the NORM Management Program shall apply.

All safe work practices and personnel protection protocols shall be designated by individual Worker Protection Plans based on the activity and the specific radiation levels of a given facility. The Worker Protection Plan shall also specify site posting requirements, personnel dosimetry, additional survey requirements, and disposal of NORM contaminated materials to licensed waste facilities. Worker Protection Plans will be required when periodic surveys confirm gamma radiation levels at or above the regulatory limit of 50 \cdot R/hr. The Worker Protection Plan shall be submitted to the respective state's (or local authority's) Department of Health for review prior to personnel being exposed to NORM.

Note: The regulatory limit for NORM in most states is 50 \cdot R/hr. However, the state regulatory authority should be referenced when completing Worker Protection Plans for a geographic area.

ENVIRONMENTAL PROGRAMS

Air

The Federal and State Clean Air Acts regulate numerous construction and operational aspects of many facilities, including compressor stations, gas processing plants, and other emission sources. Under the CAA, many stationary sources of air pollution cannot legally operate until an air permit is obtained and met. A "stationary source" is any

non-mobile equipment or facility that emits any air pollutant. Common stationary sources in the natural gas industry include temporary or permanent compressor engines, generators, tanks, dehydrator pumps, fire tubes, re-boilers or associated equipment, boilers and vaporizers. Stationary sources may be subject to different requirements depending on the amount and type of emission sources and the quality of the air near the source.

New Stationary Sources Requiring Construction Permits

Some new stationary sources of air pollution require a construction permit before construction commences. The HSE Department should be contacted immediately upon learning of such projects, as construction permits and permit modifications can take months to obtain. In addition, DTC Management should be notified if there are any proposed design changes to the initial design that could affect emissions, as such changes can extend the permitting process.

Proposed Stationary Source Modifications Requiring Permits

Upon “modification,” some existing stationary sources are subject to permit adjustments and/or additional air pollution control requirements. For these purposes, modification refers to any of the following situations:

- Any physical change in a source
- Any change in the operation of a source
- Any relocation of source equipment (moving equipment)
- Changes in the amount of any air pollutant (up or down)

The HSE Department should be consulted if any stationary source is modified. However, as discussed immediately below, activities classified as “routine maintenance, repair or replacements” are not considered modifications and can be performed without first contacting the HSE Department.

Routine Maintenance, Repair, and Replacements

“Routine maintenance, repair and replacement” activities are not considered modifications and do not require permit reviews. Detailed records shall be maintained for routine maintenance, repairs and replacement occurrences. However, such activities will be noted on project approval documents indicating that emissions were not affected. Activities that can be performed without contacting the HSE Department include, but are not limited to:

- Engine balancing
- Inspection and cleaning
- Oil changes
- Changing of filters
- Like-for-like replacement of spark plugs

Common Activities Requiring Permit Review

Some commonly performed activities are considered modifications and do require permit reviews. Because these activities have the potential to increase emissions, it is essential they be reviewed prior to execution. The most common activities within this category are:

- Engine repairs or overhauls involving the replacement of parts with like parts
- Changing spark plug or ignition systems types
- Changing fuel valve types
- Changing or repairing the exhaust stack or inlet filter/silencer
- Changing or modifying the unit automation and controls

If the proposed activity to be performed on a source is **not** on the above list, the HSE Department **will** be consulted before the activity is performed. In addition, the HSE Department should be consulted if there are any questions as to whether any proposed maintenance, repair or replacement activity is “routine.” Activities not listed above will require HSE clearance before the activity is performed. Personnel should contact HSE if there are any questions regarding the “routine” nature of an activity.

Water

The Clean Water Act created laws and regulations that require companies to control and monitor water pollutants. For the E&P industry, those pollutants can include storm water runoff, hydrocarbon spills and salt/brine water. DTC Energy Group has established Stormwater Pollution Prevention Plans (SWPPP), Reasonable and Prudent Practices for Stabilization (RAPPS) and Spill Prevention Control and Countermeasure (SPCC) plans that can be found at local facilities as warranted or required.

SPCC (40 CFR 112)

The purpose of the SPCC is to prevent the discharge of hydrocarbons into navigable waters of the United States and adjoining shorelines, and to provide plan design guidelines for containing and cleaning such discharges if they occur.

Definitions

Harmful Quantities – Quantities that violate applicable water quality standards, cause a sheen upon the water or adjoining shorelines, or cause a sludge deposit below the water surface or upon adjoining shorelines.

Navigable Waters of the United States – Includes interstate waters, intrastate lakes, rivers and streams, mudflats, sand flats and wetlands, playa lakes, dry or intermittent stream beds and all tidally influenced waters.

Oil – Includes oil of any kind and in any form, including petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes.

SPCC Plan – A Spill Prevention Control and Countermeasure (SPCC) Plan is designed to implement safety standards, fire prevention and pollution prevention rules and regulations to minimize the potential for oil discharges.

Reportable – Requiring National Response Center (NRC) notification – releases that impact navigable waters of the United States.

Determining Plan Necessity

- A facility, which due to its location could not reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines, **does not need an SPCC Plan (Plan)**, regardless of size.
- A facility, which due to its location could reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines, **needs a Plan if any of the following conditions apply:**
 - The underground oil storage capacity is 42,000+ gallons
 - The total above ground oil storage capacity is 1,320+ gallons
- A facility that has experienced two reportable spills within any 12-month period needs a Plan, regardless of size or location. Such Plan will be submitted to the EPA Regional Administrator within 60 days of the second event.
- Plans are required for mobile or portable facilities, such as onshore drilling or workover rigs, barge mounted offshore drilling or workover rigs and portable fueling facilities.

Stormwater

If a facility or location experiences a reportable quantity release, personnel should contact the HSE Department for guidance regarding DTC's obligations under the industrial stormwater program.

Definition

Stormwater – precipitation (rain, melted snow or ice) that is collected and carried through any system of pipes, ditches, channels, gutters, surface drains or any other surface runoff discharged on or off a facility or property. Stormwater cannot encounter the following without triggering permit requirements:

- Raw materials (e.g., crude oil)
- Intermediate products
- By-products or waste products

If stormwater collects oil or other contaminants, it can lead to soil or water pollution and special permitting requirements.

Preventing Stormwater Contamination

- Substances should never be discharged, poured, unloaded or released into storm sewers, drainage ditches, sumps or ground areas, unless allowed by a facility National Pollutant Discharge Elimination System (NPDES) (40 CFR 122) or other permit.
- If any chemicals or contaminants are discovered on the ground or in the stormwater drainage system, immediate action should be taken to clean up.
- The HSE Department should be contacted if a discharge of oil or hazardous substances has occurred in association with a stormwater event. A reportable quantity (RQ) is any amount that violates applicable water quality standards or causes a film or sheen on the water surface. The HSE Department should be contacted for guidance on water quality standards in each state.
- The oil and gas industry has a categorical exemption from the industrial stormwater permitting program. However, a permit will be required for operators of oil and gas exploration, production, processing, treatment operations or transmission facilities that experience a reportable quantity discharge of oil or a hazardous substance.
- RAPPS (Reasonable and Prudent Practices for Soil Stabilization).

Wetlands

When activities occur in waters of the United States, the U.S. Corps of Engineers regulates the discharge of dredge and fill material, and the placement of structures. Some states also regulate these actions.

Definitions

Waters of the United States – Waters of the United States are broadly defined and include, but are not limited to, lakes, rivers, flood plains, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows and playa lakes.

Wetlands are defined by three indicators:

1. They support vegetation of a type typically found in saturated soil conditions.
2. They consist of hydric soils (i.e. soils that are saturated, flooded or inundated long enough by surface water or groundwater during the growing season to result in an absence of oxygen in their upper parts).
3. They are subject to wetlands hydrology, resulting in saturated soil conditions, at least seasonably.

Wetlands are difficult to identify and, generally, a wetlands expert is needed to attain a correct identification. If there is any question as to whether a site may be wetlands or waters of the United States, contact DTC Management.

Actions Possibly Requiring a Permit

Placement of a fill or structure in waters of the United States may require approval from the U.S. Army Corps of Engineers (USACE). Examples of actions, which when conducted in waters of the United States, requiring approval include:

- well sites (fill or structure)
- pipelines/flowlines
- bulkheads
- channel dredging (construction and maintenance)
- board roads
- dams

Permit Approval Time

Approval time varies depending on the nature of the action and the area impacted. Some actions covered by general or nationwide permits require no notification, provided certain conditions are met. Other actions, particularly those involving dredging or filling of a bay, lake or wetlands, are quite time-consuming – taking more than 6 months to acquire approval.

Waste Management

DTC Energy Group engages in responsible waste management practices in order to remain in regulatory compliance and embody good stewardship. Further process information can be found in the Waste Management Program documents. The Resource Conservation and Recovery Act (RCRA) (40 CFR 239-282) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC 9601) have driven the development of solid waste management laws and regulations. To meet these standards DTC Energy Group has developed guidelines which include approved waste disposal practices.

Definitions

Disposal – Discharge, deposit, injection, dumping, spilling, leaking or placing of any waste into or on land, water or air. (40 CFR 260.10). Non-hazardous oil field waste and non-hazardous waste will be disposed only at facilities approved by the HSE Department. Hazardous waste disposal will be coordinated by the HSE Department.

E&P Exemption – Certain wastes generated by the oil and gas exploration and production industry that have been exempted from hazardous classification under the RCRA, Subtitle C.

Hazardous Waste – Any waste that is listed as hazardous by RCRA, Subtitle C or that has been mixed with or exhibits the characteristics of hazardous waste.

Hazardous Waste Characteristics – Specific characteristics identified by RCRA in Subtitle C that cause a waste to be hazardous. A waste exhibiting any **one** of the following characteristics classifies it as hazardous:

1. Ignitable – liquid with flash point <140°F or non-liquid capable of causing fire when handled.
2. Corrosive – liquid with pH less than 2.0 or greater than 12.5.
3. Reactive – reacts violently with water, undergoes violent change without detonation or detonates when hit.
4. Toxic – fails Toxicity Characteristic Leaching Procedure (TCLP) test.

Non-Hazardous Waste – Any waste not meeting the RCRA hazardous waste characteristics and are those wastes not specifically listed as hazardous by any state or federal regulation.

Recycled – A waste that is used, reused or reclaimed as ingredients in industrial process to make a product or provide an effective substitute for commercial products.

Waste – Any discarded material that is abandoned, spilled, placed in a landfill or disposed of by burning or injecting downhole; anything that can no longer be used for its original purpose. Waste may be a solid, semi-solid, liquid or containerized gas that has been discarded, used, or is a by-product.

General Requirements

1. All wastes generated by Company operations will require identification and classification by appropriate operations personnel.
 - Identification and classification will include declaring the source or process generating the waste and stating whether the waste is E&P exempt. Exempt waste requires no further classification.
 - Non-exempt wastes will be classified as hazardous or nonhazardous, including methodology for determination if classified as non-hazardous.
2. The HSE Representative will prepare individual Waste Management Plans as needed for each generated waste.
 - Waste Management Plans are approved and signed by the department manager responsible for the operations generating the waste.
 - Preferred method of disposal will be stated and specific disposal site(s) identified, either on each plan by name or as an attachment to the plan in the form of an “approved” list.
 - Disposal sites will be evaluated and inspected by the HSE Department.
 - Waste will be handled and/or stored in accordance with its specific plan.
 - Waste Management Plans will identify all records/documents resulting from management of a specific waste.
 - No waste may be disposed of without a plan.
 - Hazardous and non-hazardous wastes should not be commingled.
 - Material may be disposed only at a site approved by the HSE Department.
 - Recycling is preferable to disposal.
3. Non-exempt hazardous wastes require special handling. A Waste Management Plan for hazardous waste will have the signed approval of DTC Management.

Waste Minimization, Segregation and Housekeeping

The handling and disposal of waste adds significant expense to operations. Three strategies can reduce the expenses associated with waste management:

- Waste minimization and/or product substitution results in lower costs for storage and disposal of waste. In addition, waste minimization may be required by regulation.
- Segregation of wastes prevents unnecessary disposal of nonhazardous waste as hazardous waste.
- Good housekeeping practices provide a safe working environment and reduce overall waste.

Waste Minimization

Personnel should use the following strategies to minimize waste:

- Before performing work, plan ways to minimize the amount of waste that will result.
- Substitute non-hazardous material for hazardous material if the intended use is not compromised.
- Purchase products from vendors who will take back empty or unopened/unused containers or products.
- Order and use only the amount of material necessary to do the job.
- Use products completely before shelf lives expire, using the oldest products first.
- Contact other company facilities to see if they can use extra materials.
- Keep lids on product containers tightly closed.
- Recycle materials (oil, cans, glass, cardboard, etc.).
- Reuse materials, such as paint thinners or degreasers, when possible.
- Use a rag service that will pick up used rags and return clean ones.
- Do not mix wastes improperly.
- Use drop cloths or containers to prevent spills and to collect materials for reuse.
- Require contractors to minimize waste.
- Use waste material as a substitute for a commercially produced similar product when appropriate.

Segregation of Wastes

1. Do not mix waste. Mixing hazardous and non-hazardous waste can result in the entire mixture being classified as hazardous, increasing the amount of hazardous waste requiring disposal.

2. Keep any waste (e.g., soil, transformer oils, electrical switch boxes) suspected of having any concentration of poly-chlorinated biphenyls (PCBs) in separate containers.
3. Provide separate containers for wastes to be recycled (e.g., glass, plastic, batteries, used oil, and solvents).

Good Housekeeping Practices

1. All products and wastes will be correctly inventoried, clearly labeled and properly stored. If labeling is inadequate or illegible, expensive testing may be required to properly identify the material. Improper storage can result in contamination of the material, which may then require disposal through expensive hazardous waste methods.
2. Place all types of waste into appropriate containers or recycling bins.
3. Store wastes so they do not come in contact with rainwater. If possible, store wastes in a covered area, and in covered and clearly labeled containers; or cover them with a heavy tarp.
4. Secure lids on trash cans, trash bins, drums, recycling bins and other waste containers so waste stays inside. Remove funnels after use and close the drum or container.
5. Store empty product drums and/or containers as follows:
 - Close lids securely.
 - Place containers on wood pallets or on a rack at an angle (45-degree angle or more) to prevent the collection of rainwater and/or corrosion on the top and bottom.
 - Drum storage areas will have secondary containment.
6. Keep flammable liquids (e.g., fuels, small cans of gasoline) in a designated location that is at least 50-ft. from the property/lease line and store in appropriate, labeled containers.
7. Use poly-liners, tarps or other portable containment equipment constructed of a non-reactive material to catch spills or drips that may occur.
8. Keep spill control and clean-up equipment ready and in good condition.

Weed and Pest Control

Selection of Herbicide and Pesticide

The following guidelines should be followed regarding herbicide and pesticide use:

- Do not use any herbicide or pesticide unless it is approved for use by the county in which it is used.
- Do not use any herbicide if it contains arsenic or 2-4D.
- Do not use any herbicides on any pipeline segment or company facility that is adjacent to or intersects creeks, streams, drainage ditches, rivers, livestock areas or in highly populated areas.

- Use only licensed personnel to apply herbicides or pesticides.
- Over-the-counter products, such as “Roundup,” do not require licensed applicators.
- Notify the Operator/Client of proposed herbicide and pesticide application where project approval is required.

Use of Approved Herbicides and Pesticides

1. Advise persons handling, applying or working around herbicides and pesticides, or areas where they have been applied, that the herbicides and pesticides are being used and contain hazardous chemicals.
2. Maintain a copy of the MSDS document for the herbicide or pesticide product at the site or work location where it is being used.
3. Maintain records of applicator contractor licenses on site.
4. Encourage each employee to read the MSDS document in order to become familiar with product characteristics.
5. Employees who will be handling herbicides or pesticides are required to read the MSDS document.
 - If an outside contractor is applying herbicides or pesticides, obtain a copy of the MSDS from the contractor prior to application of the substance.
 - Follow the manufacturer’s directions concerning the use and application of all herbicides and pesticides.
 - Use appropriate personal protective equipment (PPE) while working with herbicides or pesticides.
 - Ensure that empty herbicide and pesticide containers are not reused for any purpose other than the original use.
 - There may be specific landowner requirements for application of herbicides or pesticides on lands belonging to the Bureau of Land Management, the state or tribes.

ONE CALL NOTIFICATION NUMBERS

Before digging, drilling, or excavating, call the appropriate utility locating service.

NOTE: Calling “811” in most states will connect the caller with that state’s Buried Utility Locate Dispatch for marking underground utilities. Most “One Call” agencies require a minimum of (2) business days to locate buried utilities before mechanized digging, drilling or excavation can commence.

Alabama.....	1-800-292-8525	Nebraska.....	1-800-331-5666
Arizona.....	1-602-263-1100	Nevada.....	1-800-227-2600
Arkansas.....	1-800-482-8998	New Hampshire	1-888-344-7233
California	1-800-422-4133	New Jersey	1-800-272-1000
Colorado.....	1-800-922-1987	New Mexico.....	1-800-321-2537
Connecticut.....	1-800-922-4455	New York – exc. NYC	
		& Long Island.....	1-800-962-7962
		NYC/Long Island...	1-800-272-4480
Delaware.....	1-800-282-8555	North Carolina	1-800-632-4949
Florida.....	1-800-432-4770	North Dakota	1-800-795-0555
Georgia	1-800-282-7411	Ohio.....	1-800-362-2764
Illinois		Oklahoma	1-800-522-6543
(excl Chicago)..	1-800-892-0123		
Chicago only....	1-312-744-7000		
Indiana.....	1-800-382-5544	Oregon.....	1-800-332-2344
Iowa.....	1-800-292-8989	Pennsylvania.....	1-800-242-1776
Kansas.....	1-800-DIG-SAFE	Rhode Island	1-888-344-7233
Kentucky.....	1-800-752-6007	South Carolina	1-800-922-0983
Louisiana	1-800-272-3020	Tennessee.....	1-800-351-1111
Maine.....	1-888-344-7233	Texas	1-800-245-4545
		and.....	1-800-669-8344
		and.....	1-800-344-8377
Maryland.....	1-800-282-8555	Utah.....	1-800-662-4111
Massachusetts		Vermont.....	1-888-344-7233
in state.....	1-888-322-4844		
out of state	1-888-344-7233		
Michigan.....	1-800-482-7171	Virginia.....	1-800-552-7001
		N. VA.	1-800-257-7777
Minnesota.....	1-800-252-1166	West Virginia	1-800-245-4848
Mississippi.....	1-800-227-6477	Wisconsin.....	1-800-242-8511
Missouri	1-800-344-7483	Wyoming – call both.....	1-800-348-1030
			1-800-849-2476
Montana	1-800-424-5555		
	1-800-551-8344		

AGENCY INSPECTION PROCEDURES

When an inspector from any federal, state or local agency with HSE jurisdiction arrives, employees having the initial contact should:

- Verify the inspector's credentials and agency involved (local, state, tribal, federal).
- Determine basis/purpose/type of inspection.
- Notify a supervisor and the HSE Department immediately.
- As appropriate, conduct and document an HSE orientation for the facility.
- Defer inspection until supervisor arrives. If unable to contact, proceed.
- Follow all safety procedures during inspection (PPE, rules, etc.).
- Maintain detailed record of inspector's activity.
- Record same physical measurements and take same photographs as inspector.
- Permit review of records related only to inspection.
- Avoid answering and defer question(s) that are not understood.
- Request abatement recommendations in closing conference.

Note: Employee has the right to refuse to be interviewed and the right to request the presence of a DTC representative when participating in an OSHA or MSHA inspection.

INCIDENT NOTIFICATION PROCEDURES

Notification Process

When an incident occurs, employees should:

1. Determine the incident type.
2. Make initial telephone notifications.

Note: Activate the Crisis Management Incident Response Plan if the event level dictates.

3. Enter the report information onto the appropriate DTC incident form or client database as available.
4. Forward incident report form within noted reporting time frames.

Documentation of a “return to work” release must be furnished to the Supervisor from the attending Physician whenever an employee with a restricted duty or lost-time injury returns to work.

Note: Telephone notifications need to be made within specified reporting time frames, and persons making the notifications must follow their business unit reporting requirements.

Required Documentation or Notification

- A. Telephone Notification
- B. Incident Report (Injury, Vehicle, Occurrence or Environmental)
- C. Police Accident Report (If one taken)

Contacts

- 1. Immediate Supervisor
- 2. Team Leader/Manager/Director
- 3. HSE Representative of Opts Mgr
- 4. CEO or COO
- 5. CEO or COO

Note: Contractors are required to provide a copy of the completed contractor incident report for incidents occurring on DTC locations or conducting business for DTC.

Incident Type	Reporting Time Frame		
	Immediately	Within 24 hours	Within 5 Business Days
First Aid	A-1	B-2,3	
Medical	A-1,2,3	B-4,5	
Restriction/Job Transfer	A-1,2,3	B-4,5	
Days Away from Work	A-1,2,3,5	B-4	
Death	A-1,2,3,4,5,B		C
Fire	A-1,2,3,5	B	C * (If reported to 911)
Vehicle Collision	A-1,2,3	B-4	C
Vehicle Collision(Third Party Injury	A-1,2,3,5	B-4	C
Near Hit/Close Call	A-1	A-2,3, B	
Company Property Damage		A-1,2, B	
Spill/Release (non-reportable)	A-1,2,3	B	
Spill/Release (Reportable)	A-1,2,3,5	B	

Acknowledgement Page (duplicate form)

I _____ acknowledge that I have received, read and understand the contents of this 2012 Health Safety & Environmental Handbook, which serves as a reference for the minimum rules and standards for DTC Energy Group Company.

Print Name

Signature of Recipient

Date

Remove this page and return this page to one's immediate supervisor. Leave a copy in your handbook for inspection purposes.

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