

**MANTLE EXPLORATION OIL AND GAS LLC**  
**Health, Safety And Environmental Policy And Manual**

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## **1.0 OBJECTIVES**

Mantle oil and gas LLC is committed to conducting business in a manner which protects the environment, the health and safety of our employees, customers, contractors and the public. To ensure that environmental, health and safety management is integrated into all of our business activities, Mantle oil and gas LLC will:

- Advise each manager, supervisor, employee and contractor of his/her responsibilities and regularly measure performance.
- Comply fully with all applicable laws and regulations.
- Design and operate facilities worldwide using the practices necessary to protect human health and the environment.
- Assess risks before starting a new activity or divesting a facility/site.
- Provide training to protect our employees and the environment.
- Participate in proactive efforts to improve technology, laws and regulations.
- Provide professional staff to support EH&S activities.
- Monitor and report performance for continuous improvement.

## 2.0 RESPONSIBILITIES

### MANAGEMENT WILL:

- Ensure that safety receives equal consideration with production and profits by developing Safety Action Plans on an annual basis.
- Provide all employees with a work environment free from unacceptable hazards.
- Provide guidance to safety committees to ensure that all injuries, vehicle collisions, near misses, fires, and any other unsafe conditions are promptly reported and investigated.
- Accompany injured Mantle oil and gas LLC employee(s) to the doctor. If management is not available, a Mantle oil and gas LLC Job Representative shall accompany the injured Mantle oil and gas LLC employee(s) to the doctor.
- Ensure that employees have the appropriate tools and training to successfully complete each job safely.
- Ensure that all employees and contractors are qualified to perform assigned job duties.
- Communicate to all employees and contract employees the safety policies and procedures of the Company.
- Communicate to all employees and require the use of necessary personal protective equipment (PPE).
- Observe, resolve and discuss safe or unsafe behaviors as soon as they are observed.
- Ensure safety and health issues are considered before awarding contracts.
- Conduct routine inspections, observations, and/or Job Safety Analysis (JSA) to ensure all unsafe conditions and behaviors are addressed.
- Conduct/assign periodic safety meetings and ensure every safety meeting is properly documented.
- Ensure the use of Hazardous Operations Plans, Safe Work Permit, Work Plans, or other process as applicable.

### EMPLOYEE WILL:

- Demonstrate responsibility by actively caring for his/her own safety and the safety of their fellow workers.
- Immediately report all injuries, vehicle collisions, near misses, fires, and any unsafe conditions to their supervisor and if possible correct situations.
- Ensure incidents are entered into the Mantle oil and gas LLC HSE Incident Reporting & Tracking System. Participate in location safety meetings.
- Assist in incident investigations as needed.
- Conduct Safety Observations or Job Safety Analysis.
- Observe and discuss any unsafe condition, behavior and/or practice with fellow workers.
- Understand and comply with all safety rules and policies that are applicable to the location. Follow safe procedures for carrying out job responsibilities.

- Advise supervisor of all medication(s) that may interfere with ability to do a job safely.

## CONTRACTOR WILL

Be responsible for the actions of their employees by ensuring that their employees are trained and follow the rules that are applicable to the job and location, including the appropriate use of PPE. In addition, they will:

- Immediately report all injuries, vehicle collisions, near misses, fires, and unsafe conditions to the Mantle oil and gas LLC Job Representative.
- Have established Safety and Health Programs, including safe work procedures, in place before starting work for Mantle oil and gas LLC.
- Hold pre-job safety meetings in addition to regular safety meetings. Use proactive safety measures to eliminate incidents and prevent loss.
- Provide proof of training or other safety documentation upon request.
- Conduct and document incident investigations and implement corrective measures.
- Participate in safety reviews (audits) upon request.
- Gain approval before operating Company/Mantle oil and gas LLC equipment.

## 3.0 SAFETY RULES

The Company will enforce compliance of its safety policies and practices.

1. Report all injuries, vehicle collisions, near misses, fires, and any unsafe condition or practice, no matter how slight, to your supervision.
2. Hold a pre-job safety meeting to review procedures, equipment locations, and emergency plans.
3. Seatbelts are required for all occupants during the operation of Company vehicles or any vehicle being used for Company business. It is the driver's responsibility to ensure everyone has the seatbelt fastened before the vehicle is in motion.
4. When lifting or moving loads, assess the weight, bulkiness of the item, and the route of travel. Use proper lifting techniques. When the load is too heavy for one person to lift, the worker shall ask for assistance or use a mechanical lifting device.
5. Use handrails when ascending or descending stairways.
6. The use, possession and distribution of illegal drugs, deadly weapons or unauthorized explosives while on Company premises, in Company vehicles, or rental/personal vehicles while on Company business is prohibited.
7. Operation of equipment having a "DANGER, DO NOT OPERATE" tag is prohibited.
8. Under normal operations, all operating machinery and electrical switchgear are required to have all safety guards, switches and alarms in place and functional.
9. All block valves under pressure relief valves must be locked or sealed open.
10. Finger rings, loose clothing, unsecured long hair (below collar), watches, and other loose accessories shall not be worn when within arm's length of operating machinery or electrical switchgear.
11. Always use proper tools and equipment for the job. Do not use a damaged or an incorrect tool to perform your task. Damaged tools are to be replaced, repaired, or discarded.

12. 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 or fenced when in populated areas.
13. Fire extinguishers, eyewash stations and self-contained breathing apparatuses should be inspected monthly. Alarm boxes, fire doors, first aid kits and all other emergency equipment must be well maintained and readily accessible.
14. Smoking on Company premises is restricted to designated areas only.
15. Whenever a safety device is removed from service and/or defeated, the appropriate supervisor and affected parties shall be notified, the device tagged, the proper remedial action taken, and the action properly documented.
16. Do not use plastic cups, buckets, or other unapproved containers for the collection of pressurized hydrocarbons.
17. Walking on top of production tanks is discouraged. When necessary, the integrity of the tank shall be carefully checked and proper fall protection must be in place before going on top of the tank.
18. Do not walk or stand on storage tanks or piping unless they are equipped with properly designed walkways.
19. Do not stand in the "Line of Fire" when opening equipment (i.e. pig launcher/receiver, bull plug, valve, etc.).
20. Non-intrinsically safe equipment such as cell phones, pagers, cameras, and laptop computers, etc. are not to be operated in classified areas unless cleared by the Hot Work Permitting process.
21. For international operated assets, MANTLE OIL AND GAS LLC will operate to a standard that meets or exceeds those required by local country HSE regulations. In addition to the policies in this document, each operating asset may develop further
22. HSE policies which are relevant to its particular operations.

#### 4.0 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 the Health & Safety Coordinator or Facility Operations.

##### Precautions

1. Each employee shall be familiar with the location of the fire alarm pull station nearest to his/her workstation.
2. Each employee must become familiar with the appropriate evacuation route for his/her workstation. Evacuation routes for each floor and building area are clearly marked in prominent locations.
3. During fire alarms, Fire Wardens should make last-minute searches of their areas to ensure all personnel are evacuated. Help the Fire Wardens by clearing the area quickly, and aid them if they request assistance. **If a Fire Warden requests you to leave an area, do so!**

4. During evacuations, **DO NOT USE ELEVATORS!** Use the stairwells, following the nearest exit signs and evacuation drawings. Check closed doors for temperature and smoke before opening.
5. Keep all passageways, entryways, aisles, storerooms, service rooms, and work areas clean, orderly, sanitary and well maintained, with no obstructions.
6. Aisles and hallways shall provide unobstructed movement and immediate access for fire protection personnel and equipment.
7. Keep flammable or combustible material and residue in a building or operating area to a minimum. Store in metal safety cans or storage cabinets that meet Underwriter's Laboratories, Inc., or Factory Mutual approval.
8. Safely stack material/boxes (limited in height) without blocking sprinkler heads, fire exits, fire extinguishers, electrical control panels, etc.
9. File drawers and desk drawers shall not be left open. Do not overload top drawers so that cabinets tip over.
10. In case of emergency or evacuation disconnect electrically your office equipments and close your office

## OFFICE SAFETY

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Personnel working in an office environment are not immune to occupational injuries or illnesses. The following checklist should be utilized in all company office areas on a periodic basis.

### OFFICE SAFETY CHECKLIST

#### INDIVIDUAL WORKSTATIONS

- Sufficient ventilation \_\_\_\_\_
- (HVAC vents not covered) \_\_\_\_\_
- Open floor space \_\_\_\_\_

#### WALKING SURFACES

- Aisles correctly established and clear (30 inches/76 cm recommended) \_\_\_\_\_
- Void of tripping hazards (carpets/cords secure) \_\_\_\_\_
- Mats available to prevent slipping hazards \_\_\_\_\_
- Floors dry (not slippery) \_\_\_\_\_
- Wet areas appropriately marked \_\_\_\_\_

#### HALLS, RAMPS, LIGHTING

- Adequate lighting, suitable for work \_\_\_\_\_
- Ramps have non-slip surface \_\_\_\_\_
- Handrails installed and in good condition \_\_\_\_\_
- Halls kept clear of equipment and supplies \_\_\_\_\_

#### STORAGE AREAS

- Shelves and file drawers safely loaded \_\_\_\_\_
- All file drawers closed \_\_\_\_\_

- Heavy items stored at waist level \_\_\_\_\_
- Heavy storage shelves/files secured to wall \_\_\_\_\_
- No storage within 2 ft (0.6 m) of ceiling \_\_\_\_\_
- Noisy equipment isolated \_\_\_\_\_
- Boxes stored with flaps folded inside \_\_\_\_\_

**OFFICE EQUIPMENT, TOOLS**

- Chairs (springs, casters, hydraulics) in good Condition \_\_\_\_\_
- Fans guarded, secure from falling or tripping \_\_\_\_\_
- Paper cutter guard functional and blade in the down position and latched when not in use \_\_\_\_\_
- Safety steps/ladders available \_\_\_\_\_
- Chemicals properly labeled/stored \_\_\_\_\_
- Paper supplies and material safely stacked \_\_\_\_\_
- Scissors, sharp tools stored correctly \_\_\_\_\_
- Safety box cutters available and used \_\_\_\_\_
- Mechanical equipment properly guarded \_\_\_\_\_

**ELECTRICAL HAZARDS**

- Machines and equipment grounded or double insulated \_\_\_\_\_
- Proper multi-outlet devices used/circuits properly loaded \_\_\_\_\_
- Only UL Approved Extension cords are allowed - maximum length 10 ft (3 m) \_\_\_\_\_
- Power cords, plugs, and wall outlets free from defects \_\_\_\_\_
- Electrical switch panels clear (30 inches/1 m) \_\_\_\_\_
- Wiring properly routed \_\_\_\_\_
- Portable heaters with exposed elements are prohibited \_\_\_\_\_
- Any electrically operated device (i.e. coffee pot, space heater, etc.) turned off if left unattended overnight \_\_\_\_\_
- Have tip shut-off switch \_\_\_\_\_
- GFCIs must be used per local electrical codes \_\_\_\_\_

**OFFICE SAFETY**

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**FIRE PREVENTION**

- Fire extinguishers properly identified/ installed \_\_\_\_\_
- Fire extinguishers placed a safe distance from possible ignition sources \_\_\_\_\_
- Fire extinguisher tagged with current inspection \_\_\_\_\_

- and hydrostatic test \_\_\_\_\_
- Fire extinguisher and fire hose unobstructed \_\_\_\_\_
- Fire escapes and routes clear and well marked  
fire doors closed \_\_\_\_\_
- Exits properly marked \_\_\_\_\_
- Sprinkler heads unobstructed \_\_\_\_\_
- Excess paper and trash removed \_\_\_\_\_
- Flammable and combustible materials stored  
UL or FM approved containers or cabinets \_\_\_\_\_
- Open flames/candles prohibited \_\_\_\_\_

**COMMON AREAS**

- Corridors in good repair \_\_\_\_\_
- Stairways clear \_\_\_\_\_
- Restroom in sanitary condition \_\_\_\_\_
- Emergency supplies available (bloodborne  
pathogens clean-up kit) \_\_\_\_\_
- All OSHA and Worker’s Compensation notices  
posted. This may include: \_\_\_\_\_

**OFFICE SAFETY**

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**ERGONOMIC CHECKLIST**

All employees performing administrative activities shall use the checklist below. If additional assistance is needed, contact the Health & Safety Office.

- Adjust chair height so that your 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 head to hold the telephone  
receiver between head and shoulder \_\_\_\_\_
- Ensure forearms and wrists are level \_\_\_\_\_
- Avoid resting hands, wrists and arms on  
hard or sharp edges. \_\_\_\_\_
- Ensure computer table is just below  
forearm/wrist height \_\_\_\_\_
- Ensure that the work station provides  
adequate legroom \_\_\_\_\_
- 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 \_\_\_\_\_

- Alternate tasks to break up extended periods on the computer
- 

## 5.0 FIRE PROTECTION

### Fire Response Procedures

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 as appropriate, and evacuate and secure the area. Notification must be made to site supervision after the fire is contained; Only trained personnel are qualified to operate fire extinguishers and equipment. Never fight a fire if you do not know the cause or source or if it is beyond the initial stage;
- Give direction to third party fire fighting agencies.
- In case of fire, the sequence must always be: Inform, Protect and Isolate

### General Fire Fighting Procedures

1. Locate the fire fighting equipment.  
Note: WHEN ACTIVATING A CARTRIDGE TYPE EXTINGUISHER, POINT THE FILL CAP AWAY FROM YOURSELF OR OTHERS.
2. With the wind to your back, approach the fire and discharge the appropriate extinguisher at the base of the fire, sweeping the blaze as you advance.
3. After the fire is extinguished or if you are unable to extinguish it, back away facing the fire. Never turn your back on a fire. Stand-by to ensure that an extinguished fire remains extinguished and there are no flashbacks.
4. After discharging or using a fire extinguisher, return it for maintenance and recharging, or dispose of properly.

### Fire Prevention Guidelines

1. Class A fire materials (paper, wood, rags, etc.) should be minimized in process areas.
2. Buildings in which flammable or combustible liquids are being used must be well ventilated at all times. Ridge vents must remain open at all times.
3. Report and repair all process leaks immediately.
4. Perform required atmospheric monitoring prior to and during operations that involve opening hydrocarbon vessels or tanks.
5. Use "snoop" suds or intrinsically safe gas detection meters when testing for gas leaks on connections. Never use an open flame.
6. Use only approved cleaning solvents.
7. Transport fuels (i.e. gasoline, diesel, propane, etc.) only in approved safety cans with the contents clearly labeled. Never place gasoline containers inside passenger compartments. When transporting flammable liquids, secure the container to prevent spills or container movement.
8. When transferring flammable or combustible liquids from a 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. Unapproved plastic cups/buckets must not be used for collection of hydrocarbon samples.

9. Previously opened or used flammable liquid containers or aerosol cans are to be properly stored.
10. Flammable liquids are not to be stored in the compressor buildings unless stored in an approved flammable cabinet.

### **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, or exchangers. Iron sulfide fires commonly occur during shutdowns, or construction activities, when equipment and piping are opened for inspection or maintenance. An iron sulfide fire 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 work procedure, addressing iron sulfide hazards, shall be developed, communicated, and implemented where iron sulfide is likely to be present. The procedure 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 conducted prior to the start of maintenance, construction, or similar activities, if iron sulphide may be present.

## **6.0 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. Call in advance to verify.

### **General Guidelines**

- Local management is responsible for conducting personal protective equipment hazard assessments for work exposures in their area of responsibility. This assessment will be used, as the foundation for determining personal protective equipment needs.
- Personal protective equipment must meet 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.

- Additional eye/face protection such as goggles and/or face shields must be worn during grinding, welding, drilling, scraping or any operation where foreign objects may enter the eye.

#### **Head Protection**

- Approved hard hats 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).

#### **Eye Protection**

- Approved safety eyewear with side shields will be worn in field operations and other designated areas. ANSI approved eyewear is to be worn over non-ANSI approved eyewear or any not having side shields.
- Safety glasses must be equipped with rigid side shields and meet or exceed ANSI Z87.1.
- Filter lenses are required for arc welding or cutting.

#### **Hearing Protection**

- 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**

- Personnel must wear hand protection appropriate for the task when performing work that may cause injury to the hands.
- Electrical lineman's gloves are to be provided when working with voltages greater than 50 VAC and replaced or tested every six months by an approved independent laboratory. 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 shall be destroyed and replaced immediately.

#### **Foot Protection**

- Safety shoes are required when location management, PPE hazard assessments or historical data/experience dictate the need.
- Management may dictate the need for special requirements (i.e. defined heel, leather canvas, etc.).
- Safety shoes must meet or exceed ANSI Z41.1 (Compression and impact ratings).

#### **Flame Resistant Clothing**

- Flame resistant clothing is required when location management, PPE hazard assessments or historical data/experience dictate the need.
- Flame resistant clothing shall meet Federal Test Standard CS-191A (<2.0 second after flame and no more than 6.0 inches char length), or equal.
- Only manufacturer's approved modifications shall be made to garments.

### **7.0 SAFETY STANDARDS**

## **Safety Std. 1 HOT WORK**

Hot Work: Work that may generate sufficient heat to cause ignition of flammable, combustible, or explosive materials that are either present in the work area or located within hazardous proximity to the work area. Hot Work also includes the use of vehicles and non-intrinsically safe electrical equipment in a Class I/Division I or II area.

A Hot Work Permit (Form No. EN-XXXX), or equivalent is required for the following operations:

- Hot Work activities performed within a restricted area defined by area classification per API-500 (e.g. Class I/Division I or II, Generation Enclosure); or
- When Hot Work activities such as open flames, grinding, welding, burning, sandblasting, and/or Hot Oil Units used outside designated restricted areas and within 100-ft (30 m) of an area where combustible, flammable vapors or liquids could reasonably exist.

Three rules that apply to Hot Work Permitting are:

1. Areas known to be free of flammable and combustible materials are exempt from the Hot Work Permit requirement when designated by area classification per API-500.
2. Welding on lines in service, hot cuts, or hot-tapping requires following additional safety procedures in accordance with applicable standards. Consult HSE Coordinator as appropriate.
3. The lighting of burners and pilots inside of furnaces, boilers, and heaters in processing facilities under the normal operating procedures, when approved by HSE coordinator field supervisor, may be done with exception to the permitting requirements.

The permit is valid until:

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

### **General Notes Hot Work with Gas/Air atmosphere in Vessel:**

- Hot Work such as flame cutting, welding, grinding, and abrasive blasting 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 the vessel or pipe (or as close to the vessel or pipe as possible). Personnel shall not enter the vessel or pipe to perform monitoring

### **Hot Work with Nitrogen/Gas atmosphere in Vessel:**

- Hot Work such as flame cutting, welding, grinding, and abrasive blasting may be done on a vessel or pipe where atmospheric measurements do not exceed 3% by volume for the flammables tested (i.e. methane, butane, propane, etc.). The atmospheric measurements will be taken with the gas monitor's probe in the vessel or pipe (or as close to the vessel or pipe as possible). Personnel shall not enter the vessel or pipe to perform monitoring.

### **Hot Work with 100% Natural Gas atmosphere in Vessel:**

- Hot Work (flame cutting) may be done on a vessel or pipe that contains 100% natural gas at atmospheric pressure

### **Procedure**

1. Employee/Contractor requests work permit from Mantle oil and gas LLC Job Representative, i.e. qualified Company trained Contract Inspector.
2. The Mantle oil and gas LLC Job Representative reviews the job, adds precautions such as a "Firewatch", O<sub>2</sub> levels, % Lower Explosive Limit (LEL), and qualifications of welders. Proper isolation precautions must be followed in accordance with the Energy Isolation (LO/TO) Safety Standard.

**Note:** The Hot Work Permit requires that you monitor for O<sub>2</sub> and %LEL (other gases may apply) before the job begins. Test for O<sub>2</sub> first. Periodic or continuous monitoring must be performed to ensure levels remain safe. Monitors shall be calibrated and "function" tested per manufacturers' recommendations.

3. The Mantle oil and gas LLC Job Representative then signs the permit.

**Note:** Certain situations/conditions may require additional checklists and/or the HSE Coordinator's approval prior to beginning certain jobs.

4. Hotwork jobs may be allowed as long as the LEL does not exceed 10%. All practical efforts shall be made to reduce the LEL to as near zero as possible. Some situations/conditions may require the LEL of covered materials to be below 1%, consulted with HSE Coordinator. The LEL reading for Hot Work Permits shall never exceed 10%.
5. Levels in excess of 10% (less in some Business Units) 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.
6. 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.
7. The area should be checked for changing conditions as the job is performed. This should include O<sub>2</sub>, %LEL, and toxic materials.

**Note:** Alternate Hot Work Procedures may be available for certain routine operations when precautions meet or exceed those outlined in this section. Contact HSE Coordinator for more information.

### **Safety Std. 2 SAFE WORK**

This standard applies to all non-hot (cold) work equipment maintenance activities, which are non-routine. A Safe Work Permit (Form No. EN-XXXX), or an equivalent meeting these minimum standards, Job Plan, or Hazard Evaluation must be issued for specified non-hot work tasks on process equipment and piping, and for cold work in areas that could create a hazard to personnel and equipment.

**Note:** Personnel performing routine maintenance activities on equipment, under their jurisdiction, may not be required to follow this standard.

The purpose of the Safe Work Permit is to:

1. Ensure safety measures have been taken to protect personnel and equipment;
2. Ensure an understanding of the scope of work (and limitations of the work) exists between operations and maintenance, before work begins;
3. Alert maintenance personnel to the hazards, which may be encountered, or which may develop as work progresses;
4. Ensure safety precautions are observed, protective equipment is properly used, and other measures necessary for the safe performance of maintenance work on and around process systems and piping.
5. Ensure that all precautions to prevent complication during the task achievement are taken, and be aware of any interference with any other Job in progress (simultaneous operations).

Procedure

1. Issue a Safe Work Permit for specified non-hot work tasks on process equipment and piping, and for cold work in areas capable of creating a hazard to personnel and equipment.
2. Conduct an on-site inspection with those who will be performing the work, to identify potential hazards.
3. Prepare the work site or equipment by isolating all hazardous energy sources, locking/tagging, de-pressuring, draining, purging, washing, and ventilating.
4. Conduct appropriate tests for combustible and toxic agents, and provide for continuous monitoring where necessary.
5. Specify requirements for all special personal protective equipment, such as respiratory or fall protection.
6. Review the scope and all conditions and limitations specified on the Safe Work Permit on the job site.
7. Complete and issue a Safe Work Permit for non-hot work activities, as defined by the business unit.
8. Work areas must be periodically checked for changing conditions, as the job is performed.
9. The issuance of a new Safe Work Permit will become necessary when conditions have caused the nullification of a previous permit, upon changing of a crew involved in the work, the end of a shift, or when the job is completed.
10. The worker's copy of the Safe Work Permit will be retained at the job site and returned to Permit Issuer upon completion of work, whichever occurs first.
11. The Permit Issuer shall retain his/her copy of the Safe Work Permit until the job is completed.
12. Completed Safe Work Permits will be retained for a minimum of 30 days.

### **Safety Std. 3 TAGGING AND FLAGGING**

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; and
- Safety or emergency equipment unfit for use.

## Procedure

The items listed above shall be tagged in the following manner to ensure proper attention.

1. Note the following on the tag:
  - Condition or reason for tagging
  - Date
  - Equipment being tagged
  - Signature of person applying the tag
2. Document tagging in the operations log or (LO/TO) Log.
3. Properly attach the tag with a nylon tie-rop.
4. If the tag is not readily visible, a flag (bright colored ribbon) must also be attached. Flags never substitute for a tag.
5. Notify local personnel/supervision upon completion of the work.
6. Remove tags and flags after normal operating conditions are restored.

## **Safety Std. 4 ENERGY ISOLATION (LO/TO)**

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, hydraulic, pneumatic or stored pressure.

**Note:** Supervisors are responsible for performing and documenting an annual audit of the Energy Isolation (LO/TO) program at each Operating Area.

### **Procedures**

Detailed written 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.

### **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 condition or reason for tagging, the date, the equipment being tagged, the signature of person applying tag, and DANGER, DO NOT OPERATE or similar warning.

A Blind List shall be prepared where blinds are utilized to ensure proper installation and removal. The list should include the location of blinds, date installed, date removed and appropriate signatures.

### **Preparation and Installation**

1. Survey the work area and equipment to identify isolation points and the proper methods of energy isolation.
2. Shut down or turn off the machine, equipment or process.
3. Render safe by isolating and relieving any stored hazardous energy by closing valves or 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. See blinding procedures at end of this section.
4. **LOCK** out the energy source using locks, blinds, chaining of valves, double block and bleed systems, disconnecting pipe, or by other means, that prevents the release of energy. Double block and bleed is required on systems with working pressure over 1,000 psig.

**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.

5. TAG the lockout device 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 employee(s) until completion. The "crew lockout" method is acceptable only where it is defined in a written document and approved by the business unit's safety manager.

6. **CLEAR** the area of personnel and tools before attempting to relieve any stored energy remaining in the equipment prior to beginning the work.
7. **TRY** to energize (start and stop) the equipment before beginning the work. Verify that start/jog switches 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 MANTLE OIL AND GAS LLC 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**

1. Reinstall all guards.
2. Return all electrical wiring to conform to electrical code requirements.
3. Remove all blind flanges or skillets and properly connect piping.
4. Remove tools, materials, and other nonessential items.
5. Inspect and verify that all machine or equipment components are operationally intact.
6. Notify all employees in the area that LO/TO devices are ready to be removed.
7. Ensure that all employees are safely positioned or removed from the area.
8. Remove each lock and tag from each energy-isolating device.
9. Always ensure that work area is made tidy, cleaned and back to safe conditions

### **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. Notify all personnel of the activities being performed, the location, equipment affected, and duration of work.
2. Tag equipment with "DANGER, DO NOT OPERATE" tag.
3. Restrict the area access if necessary.
4. Refer to the Electrical Safety section of the handbook for more details regarding electrical work.
5. Notify all affected personnel when work is completed.

### **Blinding**

Blinds shall be installed when the release of combustible or toxic liquids, vapors or gases into the work area cannot be controlled during maintenance or construction.

#### **Procedure**

1. A full-rated blind should be installed with three (3) considerations: Rating –
  - Consult ANSI blind rating charts;
  - Location - Will the blind effectively isolate?
  - Is it accessible?
  - and Size - Does the blind match line size?
2. A Blind List shall be prepared where blinds are utilized to ensure proper installation and removal. The list should include the location of blinds, date installed, date removed and appropriate signatures.
3. Blinds shall be tagged for identification.
4. All blinds shall be removed when work is complete.
5. During hydro-test applications (line, vessel, drum, or etc.) only a rated blind flange shall be used.
6. A skillet blind of either a vendor manufactured, shop built, or on-site manufactured may be used ONLY if a tagged vent to atmosphere is located between a closed and locked block valve and the blind.

## **Safety Std. 5 CONFINED SPACED ENTRY**

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, pig launchers/receivers, engine crankcases, and turbine enclosures.

**Definitions: Entry** - begins when any part of the entrant's body breaks the plane of the entryway. Opening hydrocarbon vessels/tanks for inspections only, without breaking this plane, will not require the completion of the Confined Space Entry Permit.

### **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

**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(s) must complete and all must sign the Confined Space Entry Permit (Form No. ENXXXX), or an equivalent meeting these minimum standards. 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 can be eliminated.

**Entrant** - an individual who is authorized by the company to enter a confined space.

**Attendant** - an individual who is stationed outside a permit-required confined space. An attendant is required whenever a physical hazard cannot be eliminated and/or a hazardous atmosphere cannot be controlled through ventilation. The purpose of an attendant is to monitor and be in communication with the entrant in the event that a hazard appears.

**Note:** The attendant may also perform the responsibilities of an entry supervisor.

**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.

### **The Duration of the Permit is:**

Crew change, end of shift, or end of job, whichever occurs first.

Emergency conditions will cancel the permit; other significant changes may also cancel the permit.

### **Preparation**

In preparation for entry, a Confined Space Entry Permit shall be initiated and 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 ensure that conditions remain consistent with the permit. An evaluation will include atmospheric condition tests and a thorough physical hazard assessment.
3. Signs and/or barricades shall be posted outside confined spaces to notify unauthorized personnel when entry is in progress. Personnel entering the area shall read and adhere to all precautions, signs and permits. If they are not assigned to assist with the entry, they are not to enter the area. If the vessel or confined space is left unattended, access to the space is to be secured.
4. The confined space or vessel must be properly isolated using blinding, line disconnection, double block and bleed, in addition to proper locking and tagging. A list shall be prepared of the blinds installed (Energy Isolation (LO/TO) Safety Standard), line disconnects, locked valves, and/or opened vents.
5. Atmospheric tests for oxygen, explosive and toxic gases and vapors shall be performed and recorded on the Confined Space Entry 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 conditions shall be within these acceptable levels:
6. Cancel / postpone any other activities which may directly or indirectly affect the confined space entry
  - Oxygen = 19.5% - 23.5%
  - **Note:** Test for oxygen first
  - Lower Explosive Limit, LEL = < 10%
  - Suspected toxic air contaminants (i.e. Hydrogen Sulfide, Carbon Monoxide, etc.)

**Note:** Some situations/conditions will dictate more stringent O<sub>2</sub> and LEL levels (see business unit policy). Consult with HSE coordinator.

7. All practical effort shall be made to reduce the flammable limits to as near 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 Protection).

8. Forced air ventilation and other equipment must be properly grounded or bonded to prevent static sparks. Lighting equipment must be explosion proof and have a ground fault circuit interrupter (GFCI).
9. Where flammable or combustible gases or liquids are present, all sources of ignition shall be eliminated or controlled. If required, a Hot-Work Permit/Safe Work Permit shall be completed in accordance with the Hot Work Permit Safety Standard. Fire extinguisher(s) and other fire fighting equipment shall be available.

10. 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 an 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.
11. A minimum of two individuals must be present when entering a vessel.
12. 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 when personnel are required to enter a permit required confined space.
13. First aid and CPR training is required for rescue personnel and recommended for Attendants/Entry Supervisors. First aid supplies are to be readily available on site.
14. Emergency personnel must be notified of permit-required confined space entries. They must be trained in how to rescue people at your facility.

### **Entry**

1. 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.
2. The confined space atmosphere shall be RETESTED as often as necessary during entry to ensure a safe work environment. Consideration shall be given to continuous monitoring when working in confined spaces.

### **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?
- Is the confined space atmosphere purged, inerted and returned to the acceptable operational limits?
- Have start-up procedures been reviewed?

### **Program Review**

Permit-required confined space entry permits must be reviewed periodically, no less than annually, and maintained at the site office for one year.

### **Safety Std. 6 ELECTRICAL SAFETY**

This section contains basic electrical safety practices.

**Definitions Qualified Person Level I** - Characterized by the person whose work requires that they become familiar with the hazards, construction, operation, and maintenance of

equipment that may involve exposure to, but not work on, exposed energized parts, and be trained to perform the required tasks safely.

**Qualified Person Level II(Authorized Person)** Characterized by the person's training, experience and has been authorized by facility management to do electrical equipment and circuit related jobs:

***Being an Authorized Person:***

1. Enables the authorized Level II employee to perform work on, or near exposed energized circuits (energized at or above 50 Volts AC/DC), power generation, transmission, distribution, and transfer equipment.
2. Enables both levels to recognize, control and isolate hazardous energy sources.
3. Enables the authorized Level II employee to oversee on the job training of a Qualified Level I employee pursuing Level II designation. Level II trainees may perform this work only under the direct supervision of a Qualified Person Level II.

**Note:** A Qualified Person Level II shall perform all equipment modifications, repairs, and installations involving exposure to live parts.

**Unqualified Person** - Persons who operate electrically powered equipment, but are not trained to perform any operation or maintenance on or near any exposed energized parts.

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

**Electrical Safety Rules**

1. Only Qualified Level II and Qualified Level I employees in training and under the direct supervision by a Level II employee 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.
2. All employees are to be trained in the hazards of working on or near electric equipment.
3. All electrical circuits are to be considered energized, until the absence of electrical current is verified by a Qualified Level II employee.
4. An approved LO/TO program must be utilized to isolate the energy source.
5. Work performed on live circuits will be done as the exception and not as a rule. Work on a live 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.
6. 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.
7. Uninsulated metallic items, such as rings, neck chains, watches, eyewear etc. are not to be worn while working on or near exposed energized electrical circuits.
8. Do not render electrical interlocks 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.

9. Blown fuses shall be replaced with equal type and interrupting rating using the appropriate fuse tool and personal protective equipment.
10. Use non-conductive ladders when working on or near electrical equipment or conductors. The use of metal ladders and stools is prohibited.
11. Electrical equipment and extension cords are to be inspected prior to each use and immediately removed from service if found to be unsafe.
12. Portable cord and plug-connected equipment shall be inspected prior to each use and shall be equipped with a cord, which has ground fault protection or is double insulated.
13. Extension cord sets are not permanent installations.
14. All electrical power tools, equipment and cords are to be inspected quarterly and inspection documents are to be kept onsite.
15. Space heaters are to be turned off if left unattended. They are prohibited in some work areas (see Office Safety).
16. Secure extension cords to prevent tripping hazard.
17. GFCIs are to be tested prior to use.
18. An assured grounding program shall be established and followed if GFCI devices are not used.
19. Safety grounds shall be used when working on electrical circuits and equipment.

### **Power Lines**

1. All power lines shall be considered energized. When work is being performed near energized overhead power lines the power company shall be contacted to determine the voltage present.
2. When power lines are de-energized, they shall have safety grounds attached.
3. No part of a crane, boom, mast, gin poles or machinery shall be permitted within 10-ft (3m) 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.
4. Switch and transformer yards must be fenced (and grounded) and posted with "Entry by Authorized Personnel Only" and "Danger High Voltage."

### **Battery Safety**

1. Safety glasses with side shields, acid resistant gloves and aprons shall be worn when measuring storage battery specific gravity or when handling electrolyte.
2. Eyewash or shower stations for quick drenching and flushing of the eyes and body shall be provided within 25 feet of the battery area, unless batteries are the enclosed type with explosion proof vents, in which case sealed eye rinse bottles and neutralizing packs may be substituted for eyewash/shower stations.
3. Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.
4. An emergency kit will be located near the door of each battery room and will have as a minimum; protective gloves, goggles, apron, bottled eyewash solution, and acid neutralizing agent.

## **Safety Std. 7 FALL PROTECTION**

Mantle oil and gas LLC has established a written fall protection program that includes the following minimum requirements when performing work tasks at heights greater than 6-ft (1.8 m) from the walking/working surface. Employees shall be trained in the Fall Protection Program. Fall Arrest Systems are to be used when other fall protection systems are impractical or insufficient (i.e. scaffold work requiring top and midrails to be removed).

**Note:** Fixed moveable platforms used on bridge cranes also require fall protection.

### **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;
- An appropriate anchorage attachment capable of supporting at least 5,000 lbs.; and,
- Connectors

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

**Note:** The use of waist belts for fall arrest and non-locking snap hooks is prohibited.

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.

#### **Note:**

1. Fall Arrest equipment is not to be used to hoist equipment/materials.
2. If an employee is working in an area where he/she 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.
3. 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.

### **Ladder Safety – General**

1. All portable ladders will be a minimum of Class 1A rated for 300 lb. (136.1 kg).
2. When climbing up or down any ladder, face the ladder and maintain a 3-point contact with hands free of materials.
3. All ladders must be inspected before each use. Damaged ladders should be removed from service until repaired.
4. 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.
5. All metal ladders should be labeled "NOT FOR ELECTRICAL USE."
6. Workers shall utilize fall protection when working 6 or more ft above the nearest worksurface.

### **Non-Self-Supporting Ladder (Portable Extension Ladder)**

1. Ladder shall be positioned at a safe angle, which is typically a 4:1 vertical to horizontal ratio.
2. 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 secure 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.
3. A portable extension ladder must extend 3 feet (1 m) past the point of support when accessing a working surface (i.e. roof).

### **Self-Supporting Ladders (Portable Step Ladders)**

1. A step ladder must be used with the spreader bars in the locked down position; never as a straight ladder.
2. Never stand on the top two steps of a self-supporting ladder.

### **Personnel Lifts**

1. Written operating procedures are to be attached to the personnel lift.
2. A second person shall be used as a "spotter" is working in a limited work area.
3. Only equipment that has been load rated and designed for personnel lifting by manufacturer or by recognized engineering practices shall be utilized. Workers utilizing personnel lifts must wear a safety harness with lanyard attached to the manufacturer's approval anchor point on the lift.
4. Personnel must work with both feet securely on the platform floor. Working with feet on a rail, or working from a ladder placed in the personnel lift is prohibited.
5. All entrance gates or chains must be in their fully closed position before moving the lift.

### **Scaffolds**

1. A "Competent Person" must oversee scaffolding erection and disassembly.
2. Only use heavy-duty pole and tube and coupler scaffolds.
3. 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.
4. Scaffold heights greater than 4 times the base must be properly secured to the working structure.
5. When working under a scaffold, overhead protection is required.
6. Working from portable ladders on the scaffold platform is prohibited.
7. Guardrails shall be utilized at any height. Toe boards must be installed on platforms that are 10-ft. (3.05 m) above ground level or walkways that are 6-ft (1.8m) above ground level.
8. Fixed or secured portable extension ladders must be used to access scaffolding if no built-in ladders are present.
9. When reinforcing the scaffold, construction must be in accordance with the manufacturer's standards.

## **8.0 TRAVEL SAFETY**

Mantle oil and gas LLC employees should plan for safety during travel, giving consideration to vehicle safety, hotel safety, and avoidance of locations/situations where they have a potential to become a victim of crime. Mantle oil and gas LLC Corporate Security (713-623-0801) is available for materials and training in preparation for safe travel. If itinerary changes, immediately notify your office and home.

### **Hotel Safety**

1. Enter hotel through main entrance, if possible.
2. Keep room key with you at all times. Avoid displaying your room number.
3. When retiring for the night, leave room key on top of nightstand for immediate access.
4. When possible, avoid ground floor rooms to prevent entry through the window.
5. Inspect your room upon entering, and then secure the door.
6. Verify hotel personnel with the front desk before allowing entrance into your room.
7. Notify hotel management of suspicious activity.
8. When leaving your room, turn the radio or television to a moderate volume.

### **Hotel Fire Survival Checklist**

1. Familiarize yourself with the hotel fire plan.
2. Locate the two closest exits to your room and make sure they are clear and operable.
3. If the exit is not at the end of the hall, count the number of doors between your room and the exit.
4. Check window for alternative escape route.
5. Test doors for heat before opening and always take room key.
6. Proceed to nearest stairway exit (not elevators).
7. Crawl 8-12 inches above the floor to avoid smoke inhalation.

### **If trapped in your room:**

Notify front desk that you are still in your room.

- Fill bathtub with water to use for fire fighting and the soaking of towels/bedding. Use wet towels and sheets to seal cracks.
- Make a tent to provide fresh air if possible.
- Open window to vent the room.

### **International Travel Precautions**

1. Employee is responsible for completing a "Personal Profile" with the corporate office prior to traveling internationally.
2. Health Services will provide medical briefing, supplies and emergency instructions prior to travel.
3. Avoid conversations with strangers concerning your company, position, or purpose of trip.
4. Do not write your company name in passports.
5. Carry an extra passport copy and photo in luggage.
6. Pack any controversial material, business cards or records in luggage.
7. Travel on US based airlines where possible.
8. Do not make reservations in the company name for international travel.
9. Always keep your possessions in your sight.

## **9.0 PERSONAL SAFETY & SECURITY**

### **Personal Security Precautions**

1. Do not attempt to fight if robbed at gunpoint or knifepoint.
2. If you suspect you are being followed, quicken your pace or run.
3. Avoid carrying keys with attached identification and markings.
4. Limit the number of credit cards and amount of cash you carry.
5. Obtain necessary foreign currency or traveler's checks and avoid displaying currency.
6. Carry coins for public telephones.
7. Avoid appearing flashy and flamboyant (i.e. wearing expensive jewelry).
8. Refrain from taking short cuts through unknown areas, alleys, etc.
9. Know your associates and inform others when going out.
10. Contact your supervisor, HR, or Security if you receive obscene or harassing telephonecalls.

### **Vehicle Security Awareness**

1. Check the vehicles safety equipment frequently and try to always keep the gas tank at the minimum one fourth to one half full.
2. Park in well-lit areas, or the safest area possible.
3. Always drive with the windows up and the door locked when in a suspicious or unsafe area.
4. Have keys ready when approaching the vehicle.
5. Check around the vehicle before approaching it.
6. Look inside the vehicle before entering it.
7. Use good judgmentwhenstopping for stalled cars.

### **Workplace Security**

1. Keep items of value secure in a locked file or desk drawer.
2. Wear badges or identification cards so that they are visible, when required by location management.
3. Review all security and emergency operating proceduresoften.

### **Ensure that:**

- Personnel properly greet and/or challenge strangers.
- Gates remain locked, or otherwise secure, when not in use.
- Alarm systems are tested and working according to specifications.
- Specific lock-up procedures are followed.
- Someone is responsible for checking all doors and windows to make sure they areclosed and locked every night.
- Surveillance cameras are active for all exits and entrances.

## **10.0 VEHICLE SAFETY**

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. Drivers are also required to complete a safe driving course before operating a company vehicle, such as the Smith

DrivingSystem, or a similar course approved by Mantle oil and gas LLC management, every 3 years. Additionally these rules are to be followed:

- Drivers must maintain a valid driver's license at all times and must report any changes in status immediately to their supervisor.
- Drivers must safely operate vehicles in accordance with all applicable laws, including DOT requirements. Also, Coralgout's requirements.
- Cell phones shall be used only when safe driving techniques can be followed in accordance with state and local laws.
- Vehicles are to be maintained in a safe operating condition, and any unsafe conditions should be corrected or reported immediately.
- Vehicles left running while unattended shall be put in park with the parking brake on.
- Drivers of vehicles must ensure that all occupants wear seat belts.
- Drivers must report all vehicle incidents immediately, no matter how minor.
- The use, possession and distribution of illegal drugs, deadly weapons or unauthorized explosives while on Company premises, in Company vehicles, or rental/personal vehicles while on Company business is prohibited. Likewise, driving under the influence, as defined by local laws, while operating Company vehicles or rental/personal vehicles while on Company business is prohibited. Consumption of any alcoholic beverage while operating a vehicle on Company business is strictly prohibited.
- Drivers must conduct a 360° walk-around before getting into their vehicle.
- Vehicles will be driven with headlights on at all times. (if not prohibited by local country regulations)
- When parking, "pull through" or back into the space, unless doing so would create a greater hazard.
- Company rental vehicles should be equipped with air bags.
- Drivers are to obey all rules and laws while driving on roads and facilities.
- Drivers must perform a periodic tire maintenance check, which includes ensuring tires have proper tread depth and tires are properly inflated.
- Barriers should be used to ensure loads do not move within the cab of vehicle.

### **Load Ratings for Light Truck Tires**

Do not exceed the tire manufacturer's recommended maximum tire load and pressure ratings listed in the chart found on the passenger doorpost. If vehicle does not have the ratings located on the post, refer to the vehicle information booklet for maximum recommended loads and pressure.

### **Safety and Emergency Equipment**

The following emergency and safety devices are recommended as minimum equipment to be carried in Company vehicles and maintained in an operable condition at all times. 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 & related supplies  
1 -ABC Fire Extinguisher
- P/U or Trucks: 1 -First Aid Kit & related supplies

- 1 -10 lb. BC Fire Ext.
- Recommend 20 lb. Fireext. or greater.
- 3 -12" X 12" Red Flags
- 3 -Reflective Triangles\*

## **11.0 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 a Motorized Equipment Program that includes the following minimum requirements:

1. Inspect the equipment before each use.
2. 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.
3. Only properly trained personnel shall operate motorized equipment.
4. All affected utilities are to be identified and notified using the One-Call system before beginning any excavation work or use of heavy equipment.
5. Operator must perform 360 degree walk-around before operating equipment.
6. No equipment shall be operated when any part of that equipment can encounter overhead lines. Maintain a minimum of 10 feet clearance from lines. (See electrical safety section of this handbook.)
7. Before moving tall equipment, review travel route for low hanging power lines and other low clearance structures.
8. Ground personnel should maintain a safe distance from operating equipment and establish eye contact with the operator before approaching.
9. 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.
10. Personnel shall not be allowed to ride on or work from any part of the equipment unless specifically designed for personnel.
11. 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.
12. No employee shall move or allow construction equipment or vehicles to be moved upon any access roadway or grade unless the access roadway or grade is constructed and maintained to safely accommodate the movement of the equipment and vehicles involved.
13. All equipment shall be operated in a manner, which 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.
14. Wheels of trucks and rubber tired heavy equipment must be checked when parked on inclined grades.
15. 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 deenergized. Buckets, lifts, forks, blades, etc. shall be lowered to the ground before being left unattended.

16. 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.
17. Prior to beginning work, contractors must establish a designated equipment storage area that meets Company and local authority approval.

### **MATERIAL HANDLING EQUIPMENT**

All material handling and construction equipment (except side boom pipe laying tractors), of more than 20 horsepower are to be equipped with a Roll Over Protection System (ROPS).

1. Seat belts must be provided and worn on all material-handling equipment equipped with a rollover protective structure.
2. Appropriate fire extinguishers must be available when operating all heavy equipment such as tractors, backhoes and dozers.
3. All bi-directional machines shall be equipped with an audible backup alarm.
4. Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.
5. Equipment shall have an operable parking brake.
6. All cab glass shall be safety glass, or equivalent, that produces no visible distortion for the operator.
7. All vehicles in use shall be checked at the beginning of each shift to ensure parts, equipment, and accessories are in safe operating condition. All hoses shall be inspected prior to operating equipment. Leaking or deteriorated hoses shall be replaced before the equipment is operated.
8. Rear window glass on winch trucks shall be protected.
9. Load control will be maintained at all times.

### **FORKLIFTS**

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 performance evaluation 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 their 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).

### **Standards**

1. Complete inspection checklist before each use. Check for warning and safety devices. Report any deficiency to supervision.
2. Seat belts shall be used when operating forklifts.

3. To prevent movement, make sure the brakes are set and the wheels are blocked on a trailer or truck that is being loaded or unloaded.
4. When the forklift is not in use, the forks must be resting on the ground.
5. Handle loads only within the rated capacity of the forklift.
6. Carry loads low, with forks just off the ground and tilted back.
7. Do not allow any person to stand or walk under elevated forks, whether loaded or empty.
8. Move 55-gallon drums on pallets, a drum rack, in a basket, or with a drum handling extension. Drums shall not be moved by "sandwiching" them between forks.
9. Do not use a forklift to raise people for overhead work without an approved, load rated platform for use with forklift.
10. Forklift shall be "shut off" before an operator exits the equipment.

### **COMPANY USE OF ALL TERRAIN VEHICLES (ATV'S)**

1. ATV's will include any motorized off highway vehicle 53" or less in width, a dry weight of 700 lbs. or less, traveling on four (4) or more low pressure tires, having a seat to be straddled by the operator and a handlebar for steering control. Threewheeled ATV's are prohibited.
2. All ATV's will have the proper warning placards affixed to the vehicles. These placards include General Safety requirements, weight capacities and tire pressures needed on the vehicle.
3. All Operators of ATV's will complete a training course given by a "qualified" instructor approved by the HSE Coordinator.
4. A pre-ride inspection (T-CLOC) will be performed before operation of an ATV.
5. Carrying a passenger on an ATV is strictly forbidden.
6. ATV's will not be operated on maintained highways or streets.
7. Seat belts will be used when provided.
8. Proper Personal Protective Equipment will be worn when operating an ATV. This includes:
  - A DOT, Snell or ANSI approved helmet with face shield and/or impact resistant goggles
  - Long sleeved shirt and long pants
  - Proper gloves. Leather or heavy cotton work gloves are suitable.
  - Boots that fit over the ankle
  - Other PPE applicable to the type of work being performed (See the "Personal Protective Equipment" section).
9. Never operate the ATV more than 20 miles per hour or on extremely steep inclines.
10. All equipment carried on an ATV must be properly secured.
11. Never exceed the proper weight capacities of the ATV.

### **12.0 OFFSHORE SAFETY**

The offshore environment offers some unique hazards. This section provides an overview of travel to and from offshore platforms and rigs and other operations. Offshore operations are also required to maintain an Emergency Evacuation Plan to ensure proper preparation and evacuation procedures in case of severe storms. "Going Offshore" orientation programs and platform rig briefings must be provided to new employees and visitors.

### **Reporting in at a Shore base**

1. Report to the Dispatcher or gate guard at the shore base or pier to arrange transportation. Transportation will be by helicopter or by boat.
2. Complete the Passenger Manifest including name, company and destination. Personnel and baggage weight are also required for helicopter travel.
3. All travelers should have the applicable personal protective equipment (hard-hat, steel-toed shoes or boots, eye protection, hearing protection, or flame resistant clothing).
4. First-time travelers should receive the "Going Offshore" orientation. This orientation must be documented.

### **Reporting in at an Offshore Platform/Rig**

1. Report immediately to the person in charge of the platform. Sign in as required.
2. Platform procedures should be explained. Procedures include:
  - Assigning you to your section and duties in the event of an emergency.
  - Making your bunk and locker assignments (if applicable)
  - Familiarization of applicable structure, emergency alarms, etc.
3. Become thoroughly familiar with all emergency procedures, exit routes, and emergency reporting locations.
4. Do not throw anything overboard. Carefully follow all rules designed to prevent pollution.
5. Immediately report any escaping oil and gas or other hazards to the Mantle oil and gas LLC Job Representative.

### **Survival Craft**

Survival craft or capsules are provided on some platforms FPSO and all mobile drilling rigs. All personnel should be trained in their maintenance and use, and regular drills should be held.

Precautions include:

1. Always have a lifejacket inside and outside of the survival craft.
2. Do not operate release mechanism before reaching the water
3. Once inside the survival craft, personnel should stay seated with their seat belts fastened.

### **Boat/Vessel Safety**

1. Follow the boat captain's instructions. The captain is in complete charge of the boat and its passengers. The captain has the authority to refuse passage to anyone considered an unsafe passenger. Follow the captain's instructions as to the loading procedures, storage of luggage and cargo, seating arrangements, smoking restrictions and personnel transfer.
2. Provide the captain with all information requested at the time of boarding. This can include your name, company affiliation and destination.

### **Personnel Transfer**

The boat captain or person in charge must agree that conditions are safe for personnel transfer.

1. When performing personnel transfer over open water, YOU SHALL WEAR A TYPE I or II LIFE JACKET snugly fitted and securely fastened while on the boat deck and during personnel transfer by personnel basket or swing rope.
2. Transfer by personnel basket: Position yourself on the deck of the boat as directed by the boat crew. The basket will be lowered onto the deck from the structure or rig platform. When it is on the deck, place your luggage in the bottom center of the basket. Place one foot on the outside rim of the basket, and grasp the basket ropes securely. Keep your knees slightly bent or flexed, and be prepared for unexpected moves, particularly in rough seas. As the basket is lifted off the boat deck, step onto the outside rim of the basket with the other foot. Do not lean in or out, but stand straight up. Only personal articles should be transferred in personnel basket.

**Note:** Cranes used for personnel transfer must be certified for this purpose.

3. Transfer by swing rope: Face where the boat is against the platform. Have both hands and arms free; catch the knotted rope when the boat is on top of a swell and swing to the platform by pushing off the boat with your feet. Do not let swing rope get between your legs. Always keep feet and legs clear of the platform.

Note: This kind of transfer is not allowed under normal operations, only in case of emergency.

Note: Do not carry luggage while transferring by swing rope.

4. In the event that a person falls in the water, immediately shout "Person Overboard". Assist in the rescue as directed by the captain. Keep an eye on the person in the water at all times. Do not lose his/her position in the water until assistance arrives.

### **13.0 MARINE SAFETY**

The marine environment offers some unique hazards that differ from land-based work environments. Traditional Safety & Health programs have originated from OSHA regulatory requirements, many of which do not apply to the marine transportation industry. MANTLE OIL AND GAS LLC has elected to adopt these traditional OSHA programs as "Best Practices" for ALL business units, where feasible.

#### **Basic Marine Safety Rules**

1. It is the policy of MANTLE OIL AND GAS LLC Marine to operate safely and in full compliance with all safety regulations. All employees are to support this policy and all corporate safety policies.
2. Employees shall report and investigate injuries, occurrences, and spills immediately.
3. No employee or visitor shall board any vessel if he/she is under the influence of alcohol or illegal drugs.

4. The use, sale, possession, distribution, manufacture, and/or presence in the body of illegal drugs or inhalants, or the improper use of alcohol or prescription drugs by employees or contractors is strictly forbidden while on Company premises, on Company vehicles, or conducting Company business on or off Company premises.
5. The use of medications, including over the counter medication, is subject to permission of the vessel Captain. The Captain must be informed of all medication so he can review any possible side effects with the crewmember.
6. Station bills shall be posted on each vessel. Each crewmember must review his/her assignment aboard the vessel and be prepared to respond in an emergency. Learn your station immediately upon boarding your assigned vessel.
7. Learn the location of all emergency equipment aboard your vessel. Know how to use the equipment before an emergency arises.
8. If you discover a fire, report the fire first, then fight the fire with the available equipment until assistance arrives.
9. Participate in vessel drills and treat them as real emergencies. Always respond with the appropriate equipment and report to your specified location.
10. Observe all "No Smoking" rules. Smoke only in designated spaces.
11. Cigarette lighters are not permitted on the cargo decks of ships and barges, and production platforms.
12. Newly hired personnel must be aware that hazards are involved in learning a new job. When in doubt – ASK. Always know exactly what you are supposed to do before you try to do it.
13. Vessels must be kept clean and free of safety hazards. Good housekeeping will eliminate most hazards before an incident occurs. Stow lines, rigging, buckets, etc. when you finish a task.
14. Place all oily rags in proper storage containers and empty those containers as instructed on a regular basis.
15. Passageways, stairways, and ladders must always remain unobstructed, clean, and free of tripping hazards. Never lay lines, cords, or wires across or down stairs.
16. Decks and walkways must be kept dry. All wet or dry cargo residues must be removed as soon as possible.
17. Handrails must be used at all times when using stairs or permanently installed ladders. Always face steep stairs when going up or down. Never attempt to use the stairs when both hands are full or your vision is obstructed.
18. When walking on barges, take an inboard path, not the outside edge.
19. Always carry a load on your outboard shoulder. Be prepared to let the item you are carrying fall overboard instead of yourself.
20. Use of non-intrinsically safe equipment (including cell phones, some pagers, computers, cameras, etc.) is prohibited on decks of tankers, production platforms and barges and in enclosed spaces that are not part of the accommodation block. Cell phones and other such devices are to be turned off when on decks of tankers, production platforms and barges.
21. Always wear the correct personal protection equipment (PPE) and clothing appropriate for the hazards of the task you are performing.
22. Do not wear finger rings, dangling earrings, or loose jewelry while working on deck or in the machinery spaces.

23. Proper eye protection must be worn when using power tools, airlines, welding/cutting equipment, chemical vapors or liquids, or any activity, which increases the chance of foreign material entering your eyes.
24. Hearing protection must always be worn when in the engine room, generator room, machinery areas, pump room, or when passing through spaces that have high noise levels.
25. Use only MSHA or UL flashlights approved for hazardous environment while in confined spaces or on the cargo deck.
26. Always use a flashlight at night. Be sure that you illuminate the deck area rather than step into a shadow. Never step where you cannot see the edge of a vessel or the deck. Always use the buddy system at night when checking the tow. Never go out on the tow aloft without checking with the pilothouse first.
27. When laying wires, handling lines, etc. always work inside the line and protect yourself from a fall overboard. Always wear leather gloves when handling wire.
28. Line handling while locking or docking a tow may present a hazard to anyone who is not alert to his or her surroundings. Stand clear when handling line on a timberhead, capstan, or winch. When possible, have someone back you up.
29. Do not stand in a bright of a line at any time.
30. Do not lean over the edge of a vessel to grab a line. Use a boat hook, pike pole or heaving line to pass lines.
31. Be alert for other hazards that may arise while locking or docking. Hard bumps between the barges or between a barge and a lock wall may occur. Avoid an unsafe situation by paying close attention to what is happening around you. Inattention may lead to injury.
32. Never use your foot in the spokes of a winch wheel, to tighten or loosen the winch.
33. Use the foot brake to stop a spinning winch wheel. Never try to stop a spinning winch wheel with your hands.
34. Always help other crewmembers stay safe by passing the word about vessel bumps or other situations that might catch them by surprise. Hold on to something when you hear the word "BUMP" or see one coming up.
35. Always step and never jump from a vessel to a vessel, dock to a vessel, or vessel to a dock. Use ladders, fenders, pigeon holes, etc. to assist your movements. Always wait until you can make the move safely.
36. Never work around the edge of a vessel (open hatch way or ladder well) with your back to the water (or opening) unless there is adequate railing.
37. Never lean on lifelines, rails, lock walls, or over the edge of a vessel.
38. Always use a portable ladder correctly. Set the ladder at a safe working angle on secure footing. Do not try to use a ladder as a horizontal bridge. Always tie off the top of a portable ladder.
39. Repair or replace defective tools. Do not use a tool that is inappropriate for the job.
40. Never operate machinery unless all protective guards and alarms are in place and working as designated. Ensure clothing and other articles such as rags, hand tools, hair, etc. will not get caught in machinery before performing maintenance using Lockout/Tagout procedures.
41. Never step on manhole covers. Always replace a manhole cover and secure it in a watertight condition. Keep hatch covers and hatches dogged down tightly.

42. Always keep your fingers, hands, and feet away from a pinch point at mooring lines, wires, and deck fittings.
43. Never place your hands or foot between a barge and tow knee, between barges in the tow, or between the dock and a vessel.
44. When transporting rigging or lines, always carry equipment as taught. Do not try to drag lines across barges.
45. Entry into cargo spaces, ballast, and wing tanks, rakes, or voids is prohibited until proper tank entry procedures have been followed.
46. Do not stand under overhead loads.
47. Lift loads by bending your knees. Pulling the weight close to the body, and lifting with your back straight. If the load is too heavy ask for help. Use hose booms when available.
48. Sit down and wear proper flotation devices while riding in a skiff or small boat.
49. Follow instructions on MSDS for exposure.
50. Never engage in horseplay or practical jokes.
51. Do not allow unauthorized personnel aboard company vessels

## **14.0 WELL OPERATIONS**

### **Well Operations Policy**

Please refer to the MANTLE OIL AND GAS LLC Well Operations Policy for the HSE governance during the planning and implementation of drilling, testing, completion, suspension, abandonment and workover operations undertaken by, or directly on behalf of MANTLE OIL AND GAS LLC.

## **15.0 PROCESS SAFETY MANAGEMENT (PSM)**

### **PSM**

Process Safety Management is a Regulation Standard, 29 CFR 1910.119, issued by OSHA as required by the 1990 Clean Air Act. It contains the requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals.

## **16.0 INDUSTRIAL HYGIENE**

The Company's Industrial Hygiene policies are applicable to MANTLE OIL AND GAS LLC employees only; all contractors shall meet the intent of the requirements below via their own industrial hygiene programs and procedures.

## **SUMMARY**

Employees at MANTLE OIL AND GAS LLC are potentially exposed to chemical and physical agents, e.g., noise, while performing their normal work assignments. To recognize, evaluate and control exposures to such agents, the Company has adopted a policy with objectives designed to:

- Protect employee health;

- Determine chemical/physical agents being used and evaluate potential exposure to those agents; and,
- Control exposures to minimize risk.

### **Basic Rules and Procedures for Working with Chemicals**

1. Material Safety Data Sheets (MSDS) must be accessible and readily available at each location. An MSDS for each chemical in the facility should be readily available.
2. Before contractors begin work, MANTLE OIL AND GAS LLC will inform contractor of any potential chemical hazards associated with the job.
3. In case of eye or skin contact with chemicals, promptly flush the area with water for an extended period (15 minutes), remove contaminated clothing and seek medical attention. Emergency eyewash or showers must be within 25 feet of the corrosive material.
4. Promptly clean up spills using appropriate protective equipment and dispose of all materials properly.
5. Do not smell or taste chemicals.
6. Do not eat, drink, smoke, chew gum or apply cosmetics in rooms where laboratory chemicals are present. Wash hands before conducting these activities.
7. Do not use glassware or utensils used in laboratory operations to handle food or beverages.
8. Do not store food or beverages in chemical storage areas or laboratory refrigerators.
9. Chemicals and equipment shall be properly labeled and stored.

### **Chemical Handling and Storage**

1. No container should be received, accepted or transported which has been damaged or
2. does not have appropriate labeling.
3. Stored chemicals should be examined periodically (monthly) for replacement, deterioration and container integrity.
4. When chemicals are hand-carried, the container should be sealed.
5. Incompatible chemicals must not be stored near each other.

### **RESPIRATORY PROTECTION**

Any employee identified as needing respiratory protection for job responsibilities, must have a physician's approval or other qualified representative to wear a respirator, and be properly fitted annually. All personnel wearing a respirator must be clean-shaven in the seal area of the respirator to ensure a proper fit and seal. The Company/Contractor in accordance with this program must purchase all respirators. Respirators shall be cleaned after each use and stored in a sealed plastic bag.

### **HEARING CONSERVATION**

Employees who are exposed or potentially exposed to a time-weighted average (TWA) of 85 decibels (dBA) or greater over an 8 hour period will be included in the HCP.

All MANTLE OIL AND GAS LLC facilities shall be periodically assessed for continuous high noise levels (85 dBA or greater). Warning signs shall be posted at facilities 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).

**BENZENE**

Benzenemaybepresent in naturalgas, crudeoils, and gasoline. Exposure monitoring, engineering controls and personal protective equipment will accomplish the prevention and control of benzene exposure.

**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 MANTLE OIL AND GAS LLC operations. 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. When H2S is present, iron sulfide may also be present.

**HYDROGEN SULFIDE EXPOSURE**

**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 min.
Above 1000	Immediate unconsciousness and death if not revived promptly

**Note:** All hydrogen sulfide exposure victims should be examined by a physician before returning to work.

## **HYDROGEN SULFIDE**

### **Detection Devices**

1. Portable H<sub>2</sub>S monitors must be used to alert personnel who may encounter hydrogen sulfide levels beyond permissible exposure levels.
2. Fixed monitors must be used in areas where hydrogen sulfide is present in high concentrations above 100ppm.

### **Respiratory Equipment**

1. Refer to the Business Unit Respiratory Protection Program for appropriate use of respiratory equipment.
2. Escape units – Designed strictly for escape from a hydrogen sulfide atmosphere.
3. Supplied air unit – Generally used as a work unit. Such units must have a positive pressure feature and must be equipped with an escape cylinder, in case the air supply is interrupted.

### **General Requirements**

1. Use detection equipment when working in an area where there is a possibility of hydrogen sulfide gas, especially in enclosed or below grade areas.
2. Do not enter a hydrogen sulfide area without proper training (including CPR) and authorization.
3. 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.
4. 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.
5. Iron sulfide deposits are generally found in hydrogen sulfide areas i.e. 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).

## **ASBESTOS**

An asbestos survey must be conducted at each facility to identify asbestos containing materials ACM.

### **General Requirements**

1. Locations shall have an asbestos management plan (asbestos survey), which will identify asbestos at the location.
2. ACM found MANTLE OIL AND GAS LLC facilities can include transit siding/roofing, gaskets, floor and ceiling tile, window caulking, and pipe coating. This is assumed asbestos unless documentation proves otherwise.
3. Before a contractor begins work, MANTLE OIL AND GAS LLC will inform the contractor of the presence of asbestos and document such communication. Contractors shall have their own program, which shall include job procedures, training, PPE, certifications/license, etc.
4. Asbestos products will not be purchased unless non-ACM products are unavailable, and require management approval.

5. All asbestos removal (including repair/O&M jobs) will be supervised by a formally trained Competent Person. Only trained personnel shall remove ACM products.
6. No eating, drinking, smoking, or chewing in any contaminated work areas.
7. Avoid contact/inhalation with ACM material by the use of protective clothing such as gloves, coveralls, rubber boots, respirators, and eye protection.
8. Thoroughly wash exposed skin areas, which may have been exposed to ACM before eating, drinking, smoking, or chewing.

## **LEAD**

### **General Requirements**

1. Before contractor begins work, MANTLE OIL AND GAS LLC will inform the contractor of the presence of lead and document such communication. Contractors shall have their own program, which shall include job procedures, training, PPE, certifications/license, etc.
2. Lead containing products will not be purchased unless non-lead containing products are unsuitable.
3. Only trained personnel can remove lead-containing material.
4. Coatings are to 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.
5. Use chemical removal methods when applicable to reduce potential exposures.

An action level of 30 cubic micrograms per cubic meter of air as an 8-hr TWA has been established for lead.

### **NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM)**

Low-level radioactive scale can be produced in the course of some oil and gas operations. NORM is typically found in areas where large pressure and temperature changes occur, water is commingled with different pH, or where there are low flow and/or bends in the piping, specifically: heater treaters, separators, tubing, flow lines, pumps, filters, etc.

If the presence of NORM is suspected, MANTLE OIL AND GAS LLC personnel will perform an external gamma radiation survey on the affected equipment. If survey rates are greater than 50 micro-Roentgen (mR/hr), (including background radiation) the material should be treated as NORM contaminated. Procedures for the disposal of NORM contaminated materials can be obtained through the applicable Environmental Compliance Representative.

### **Safe Work Practices**

1. No eating, drinking, smoking, or chewing in any contaminated areas.
2. Avoid contact/inhalation with NORM material by the use of protective clothing such as gloves, coveralls, rubber boots, respirators, and eye protection.
3. Thoroughly wash exposed skin areas that may have come in contact with NORM, contaminated equipment or materials before eating, drinking, smoking, or chewing.
4. Saturate contaminated scale with water to prevent airborne exposures to NORM.

## **Silica**

Silica dust may be encountered during sandblasting operations, concrete demolition/cutting, and grout removal. Respiratory protection must be worn when performing any of these operations.

Sandblasting requires the use of a type CE abrasive-blasting supplied-air hood. Employees involved near the sandblasting operations must wear appropriate respirators and eye protection and avoid direct involvement with the silica dust. All other employees should not be in the general area of sandblasting operations.

## **17.0 GENERAL SAFETY INFORMATION**

### **COMPRESSED GAS CYLINDERS**

#### **Handling Cylinders**

1. Do not accept damaged cylinders.
2. Keep protective caps on cylinders not in use.
3. Keep cylinders away from direct flame, heat and sources of ignition.
4. Properly secure cylinders at all times. During movement, avoid rough handling and the striking of cylinders and comply with all DOT requirements (i.e. labeling, manifest documentation, etc.).
5. Cylinder contents must be properly labeled; return to vendor if not properly labeled.
6. Close all valves when not in use.
7. Cylinder valves must have a handle or other shutoff mechanism in place while in use.
8. 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.
9. Discharge leaking cylinders outdoors by opening the discharge valve slowly one fourth of a turn.
10. 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**

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

#### **Storing Cylinders**

1. Store cylinders in an upright, secured position.
2. 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.
3. Store empty and full cylinders separately.

## **CABLE/HOIST SLING SAFETY**

## Inspection Process

1. All metal cables, non-metal slings (nylon, polypropylene, etc.), hooks, and various components must be visually inspected and documented monthly and visually inspected before each use. Frayed or damaged nylon slings shall be cut and discarded.
2. All lifting cables and their components will be included on the company's annual hoist inspection report.
3. Qualified personnel or competent, trained personnel shall make inspections. Test results and supporting documentation shall be maintained on file.
  - Cables, hooks and other devices that do not meet the inspection criteria shall immediately be removed from service.

## Rigging Practices

- Do not damage machines and any soft surfaces of the load with the lifting apparatus.
- Avoid sharp bends in slings and protect slings from sharp edges and abrasions.
- 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 forty-five (45) degrees to reduce stress on the sling.
- Attach cable clips properly by making sure the nuts are torqued to manufacturing specifications. The saddle should be on the load cable, the U-bolt on the dead end. Remember: "You can't put a saddle on a dead horse."
- Do not stand or walk under suspended loads.
- Do not leave loads unattended at any time. Use tag lines of sufficient length to control the lift.

## Rigging Equipment

- Know the safe carrying capacity of sling chains, wire rope, hoists, and other lifting apparatus and do not overload them.
- Immediately discard defective lifting equipment.
- Inspect all rigging equipment before each use.
- Do not tie knots in sling chains, rope slings, or wire cables to shorten them.
- Do not place bolts or other material between links of chain to shorten or splice it.
- Do not use rope for rigging or lifting loads except where it is impractical to use other methods.
- Modify lifting equipment only after engineering approval.
- Do not lift or hoist any object of unknown weight.

## Hand Signals

Recommended Hand Signals (Exhibit II & III) for Controlling Crane Operations.

{insert pictures}

## HELICOPTER SAFETY

1. Keep clear of the helipad until the helicopter has landed.
2. Keep all lightweight articles (raincoats, windbreakers) secured while the helicopter is approaching or departing.
3. Approach or depart the helicopter only on signal or command from the pilot.
4. Approach or depart the helicopter from the front quadrants or either side to avoid the tail rotor. Under NO circumstances walk near or under the tail rotor. Use caution when accessing baggage area (See Exhibit below) to review helicopter danger areas.
5. Crouch and keep your arms/hands below shoulder height when approaching or departing the helicopter. Beware of the large main rotor and its updraft.
6. Keep a firm grip on articles, including hard hats, when walking to and from the helicopter.
7. Declare any suspect hazardous materials. Many of these materials are not allowed to be transported by passenger aircraft.
8. Follow the pilot's instructions, who has complete charge of the helicopter and its passengers.

{insert picture}

## GENERAL SAFETY INFORMATION

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### HEALTH AND SAFETY SERVICES

For information on additional services, contact the Health & Safety Coordinator.

**Location/Department Safety Meetings** - Regular safety meetings for employees should be scheduled and documented by the MANTLE OIL AND GAS LLC supervisor. Documentation should include names of attendees, topics covered and the date.

**Pre-Job Safety Meeting** - Pre-Job Safety Meetings shall be conducted and documented before large projects or unusual jobs are performed. Documentation must include names of attendees, topics covered and the date. All contractors or sub-contractors should be included in pre-job meetings. For assistance in documenting the meeting, a Pre-Job Safety Meeting Checklist should be completed.

**Safety Reviews** - The goal of the safety review process is to cost-effectively reduce risk and improve safety performance by formally focusing on key processes. The reviews are accomplished by interviewing employees, conducting inspections, and reviewing documentation.

**New Employee Orientation** -The purpose of the Safety Orientation is to provide every newly hired or transferred employee an overview of the company safety rules and procedures to emphasize the importance of working safely. The orientation is established to provide employees the information necessary to prevent injuries or illnesses as part of the Company's overall Injury and Illness Prevention Program.

**Management Training** - Workshops are offered that provide members of management with tools necessary to carry out their responsibilities in the area of health and safety. Particular emphasis is placed on tools that the supervisor can use to demonstrate that safety is equal to other areas of the business.