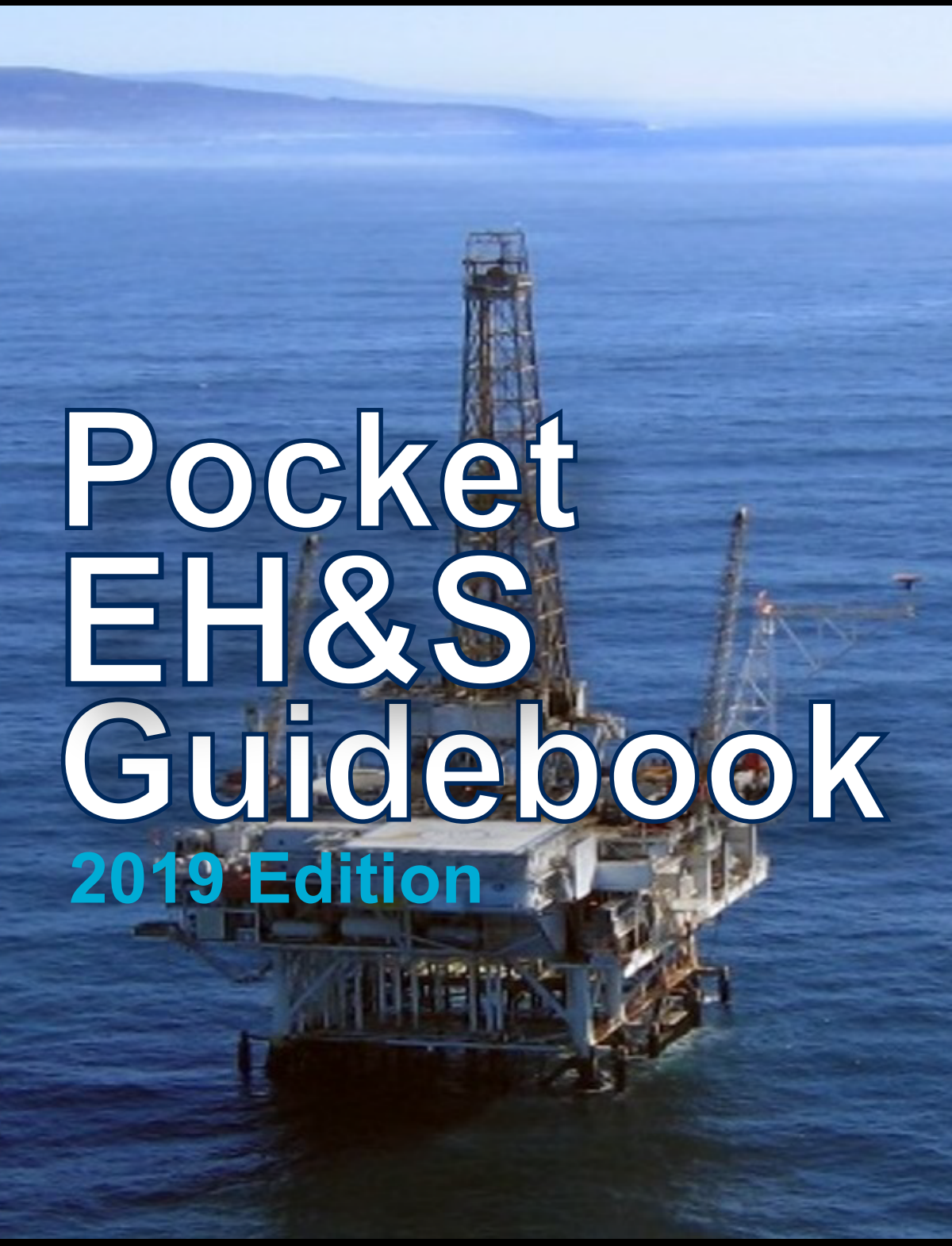
FREEPORT-MCMORAN OIL & GAS



Pocket EH&S Guidebook

2019 Edition

THINK SAFETY *Wherever You Are Whatever You Do*

FREEPORT-McMoRan OIL & GAS

Introduction

This Freeport-McMoRan Oil & Gas (FM O&G) "*EH&S Guidebook*" is intended to provide all company and contract personnel with a summary of current policies, procedures and regulations as detailed in the Company's *EH&S Management System*. The complete *EH&S Management System* is available on the Company Intranet.

FM O&G requires everyone working at our facilities to have a basic understanding of the contents of this *Guidebook*. As helpful as they are, rules and guidelines alone cannot prevent incidents. The indispensable ingredients of a safe working environment are a concerned management team, knowledgeable supervisory personnel and a conscientious work force dedicated to the principle that incident prevention and reduction of risk are an integral part of the planning and execution of any job.

Every company and contract employee has the responsibility to make proper use of tools and equipment and to maintain them in good condition. Observe all established EH&S rules, follow the directions of the site supervisors and properly utilize all safety and personal protective equipment provided. It is your responsibility to report any unsafe condition, near hit or incident to the FM O&G site supervisor.

This *Guidebook* contains only the minimum information to aid personnel in safely completing a job in an environmentally responsible manner. It does not supersede any company or contractor policy or practice which may be more stringent than what is in this publication. In the event of a conflict between information in this *Guidebook* and the detailed information in the *EH&S Management System* or specific contractual agreements, the most stringent requirements shall govern.

Look for this symbol for key safety information.

FREEPORT-MCMORAN OIL & GAS

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Responsibilities for Environment, Health and Safety

INDUSTRY STANDARDS AND GOVERNMENT REGULATIONS

All equipment shall be installed and operated in accordance with applicable industry standards and local, state and federal regulations.

SUPERVISOR RESPONSIBILITIES

All supervisors shall see that instruction and guidance in correct work procedures is given to all employees under their direct supervision.

All supervisors shall inspect working conditions to ascertain that there are no environmental, health or safety hazards that can be mitigated.

All supervisors shall enforce the regulations contained herein, which apply to the work operation for which they are responsible.

All supervisors shall assure routine inspection and servicing for all equipment (including but not limited to fire water systems, fire alarms, fire extinguisher, gas testing equipment, safety showers and eye wash facilities, emergency shutdown systems, supplied air breathing equipment, etc.). Records of the inspections shall be maintained at the facility.

EMPLOYEE RESPONSIBILITIES

Each employee shall follow FM O&G written and oral instructions to perform the job in a safe and environmentally sound manner.

When the employee has any doubt regarding his job procedure or the safety involved, he should exercise his Stop Work Authority. Once work has been stopped, it will not resume until the hazard, whether real or perceived, has been adequately mitigated.

Each employee shall correct any unsafe tools, equipment, condition or practice he observes. If the employee is unable to correct the situation, he shall secure it to prevent hazards to others and shall promptly report it to his supervisor.

All incidents and injuries, whether or not requiring services of a doctor, shall be reported to the immediate supervisor on the day of occurrence. Before seeking non-emergency medical treatment, the supervisor must be notified and he will arrange for assistance by a company designated doctor.

Each employee shall be familiar with emergency procedures applicable to the job, including response to fires or injuries.

Each employee shall keep tools, equipment, facilities, and his work area clean and orderly.

DISCIPLINE

Failure to follow any safety practice or policy described in this manual shall subject the employee to disciplinary action up to and including termination, as specified in the employee handbook.

DEVIATIONS

Special circumstances may require a deviation from the practices and procedures contained herein. Any deviation must be approved in writing by FM O&G prior to commencement of work.

REVIEW AND UPDATE

On a bi-annual basis, the company will review the effectiveness of this program and update as needed.

Incident, Injury, Near Hit and Hazard Reporting

First, protect others from further harm.

Employees, contractors and visitors shall report all incidents, injuries, near hits, hazards and illnesses to his/her supervisor, or host, as soon as possible; but always before leaving the facility.

The following information should be noted.

- What happened?
- Where did it happen?
- When did it happen?
- Who was involved?
- How might a recurrence be prevented?

Any time you have an idea or observe a situation that could lead to improvement, let your supervisor know and submit an observation.

For detailed information, please refer to the FM O&G *EH&S Management System*.

Smoking

Smoking is *prohibited* at FM O&G production facilities except in specially designated "smoking areas." Smoking outside approved designated areas, including e-cigarettes, is *grounds for disciplinary action, up to and including termination.*

Follow these rules concerning smoking:

- Smoking will be prohibited in <u>all</u> enclosed places, such as buildings, offices, shacks, trailers, vehicles etc.
- Except in designated areas, smoking is prohibited inside yards, oil and gas processing facilities (including gas plants), urban drill sites, cut shacks or other structures and facilities handling flammable liquids or gases,
- Do not carry matches or cigarette lighters into any area where there may be an explosive atmosphere.
- If you are not positive that your immediate area is safe for smoking - DO NOT SMOKE!
- Discarding matches, cigarettes, cigars, etc. from any vehicle is prohibited.
- Do Not Smoke:
  - Within 100' of any well, facility, tank setting, drilling or workover rig
  - Within 25' of a doorway into a building.

Drugs and Alcohol

Drug and/or alcohol ("controlled substances") abuse in the workplace is detrimental to the health and safety of the user, other employees and the public. It also contributes to increased absenteeism, tardiness, medical costs and decreased productivity, and may result in danger to, or loss of, equipment and property.

FM O&G is committed to maintain a safe and healthy work environment for all Company employees, free from controlled substances and to provide assistance to any employee needing rehabilitation from the adverse effects of drugs or alcohol.

The Company strictly prohibits the manufacture, distribution, possession, use or sale of drugs or alcohol while performing work for the Company or its customers, or while on property which is owned, leased, or under the control of the Company, including, but not limited to, offices, warehouses, parking lots, and vehicles. All employees and independent contractors must comply with this Policy on Company property, whether they are on duty or not. Reporting to duty within four hours after consuming alcohol or working while under the influence of drugs or alcohol is also prohibited.

In accordance with these policies, employees are tested for the following prohibited drugs and substances:

- Marijuana
- Cocaine
- Opiates
- Amphetamines
- Phencyclidine (PCP)
- Barbiturates
- Benzodiazepines
- Propoxyphene
- Methadone
- Other prohibited drugs, including alcohol

The tests are conducted under the following circumstances:

- Pre-Employment
- Post-Incident
- Random
- Reasonable Suspicion / Cause
- Return-to-Duty
- Facility Sweeps

This is a summary of the Drug and Alcohol Plan, the entire plan is available upon request from your supervisor.

Right to Search

As a safety precaution, entry into any work location of FM O&G is conditional upon the Company's right to search persons and personal effects for contraband items. Searches are conducted by authorized personnel in as private and discreet a manner as practical.

Possession and/or use of illegal or unauthorized drugs, drug paraphernalia, firearms, or other unauthorized weapons is prohibited while on Company premises or in Company vehicles. The Company will exercise the right to search.

Visitor Safety

VISITOR SAFETY RESPONSIBILITIES

- Appropriate management must approve all visits.
- Visitors shall be advised of the Company's safety requirements expressed or implied. Adherence to safety rules, regulations and standards is a condition of visitation.
- Visitors must be accompanied at all times by a Company authorized guide familiar with the safety requirements of the facility to be visited. The guide shall ensure that operations are not disrupted and the visitor is not exposed to known hazards or undue risk.
- Visitors to the process areas or field locations will be required to wear:
  - Sturdy, closed toe footwear
  - ANSI Z-89 hard hat
  - ANSI Z-87 safety glasses, with side shields
  - Flame Resistant Clothing

If going unescorted, they will be required to wear an orange visitor hardhat and vest.

Each area will determine any additional PPE that may be required for the visitor.

Contractor Safety

The following information is intended to set forth the **minimum** safety requirements expected by FM O&G from its Contractors (including their subcontractors) in the performance of their operation. Each Contractor shall be responsible for ensuring that its subcontractors comply with all of the following requirements. It is at all times the responsibility of each Contractor to implement and enforce any additional safety practices that may be necessary for the safe performance of operations by Contractor personnel and its subcontractors. Additional job or site-specific requirements may be specified by FM O&G Operations Management as necessary to assure the safety of all persons involved with such operations.

CONTRACTOR RESPONSIBILITIES

- Contractor shall designate a person-in-charge for administration of these requirements. When the Contractor has twenty-five (25) or more workers on site, Contractor shall provide a full time Site Safety Representative at the job location to enforce FM O&G and the Contractor's safety requirements.
- Contractor is to ensure that all Contractor personnel are qualified and trained to perform contracted services.

- Contractor is to provide its personnel with proper and well-maintained equipment, tools and personal protective equipment necessary for the particular job being performed, unless otherwise specified by contract language.
- Contractor is to adhere to all applicable federal, state and local regulations pertaining to a particular operation for which its services are contracted.
- Contractor is responsible for ensuring that all operations are conducted in a safe manner, and for promptly correcting and reporting to FM O&G and to the Contractor's employees and subcontractors all known or suspected hazards or unsafe conditions.
- Contractor is to instruct its personnel to correct or secure, and report any known or suspected hazards or unsafe conditions to his/her immediate supervisor.
- Contractor shall immediately notify the appropriate FM O&G representative if known or suspected hazards or unsafe conditions involve FM O&G equipment/personnel.
- Contractor shall provide to FM O&G, upon request, a copy of the Contractor's written Injury and Illness Prevention Plan (IIPP) or other written safety program and policy, if required, under federal, state, or local regulatory agency.

- Contractor is to assure the work area is maintained in a clean and orderly fashion. This includes cleaning a work site at the completion of the job or project.
- Contractor is to have in place an effective Drug & Alcohol program that meets or exceeds the DOT requirements in 49 CFR, Subpart 40.

PRE-JOB MEETING

Complete understanding of the safety and health requirements of the job are critical to the overall success of the project. After awarding of bids, Contractor(s) may be required to attend a pre-job meeting to discuss Contractor safety requirements and job site safety/hazard information.

REPORTING TO WORK

All Contractor personnel shall report to the appropriate FM O&G representative upon arrival at a work location. Contractor Management shall assure that Contractor personnel are given safety orientations for familiarization with potential job site hazards and emergency procedures.

PERSONAL PROTECTIVE EQUIPMENT

Contractors are responsible for providing all Personal Protective Equipment for the protection of their employees (See PPE section). In addition, special situations may require the use of additional personal protective equipment. Each

Contractor shall be solely responsible for recognizing when such equipment is required and shall be responsible to provide such equipment. Additional personal protective equipment requirements may also be specified by FM O&G Operations Management or EH&S.

INCIDENT, INJURY, AND ILLNESS REPORTING PROCEDURES

All work-related incidents, injuries and illnesses shall be reported immediately or as soon as is safely possible to the appropriate FM O&G representative. An initial verbal report is to be made immediately or as soon as safely possible but always within twenty-four (24) hours. A written report is to be completed within seven (7) days. It is the responsibility of the Contractor's designated person-in-charge to ensure that all incidents on FM O&G property or leases involving personnel injury or illness, fire and/or explosions, property damage, hazardous material spills and vehicles are reported both to FM O&G and to all applicable federal, state and local governmental bodies and agencies having jurisdiction thereof. Contractor shall provide to FM O&G, upon request, a copy of their OSHA Log reflecting any OSHA reportable incidents that occurred on FM O&G property.

SAFETY MEETINGS

Contractors are to conduct daily "tailgate" safety meetings to discuss the day's work assignments

and proper safety precautions. Prior to beginning an unfamiliar, hazardous, or major project, Contractor personnel will conduct a safety meeting to discuss safe procedures and work practices.

LOCK-OUT/TAG-OUT

All Contractors are required to be familiar with and comply with FM O&G site-specific Lock-Out/Tag-Out procedures while working on powered equipment, when performing confined space entry operations, breaking open lines or closed systems or other operations where the control of potential hazardous energy releases is necessary for personnel safety. Contractors are expected to provide their own locks and tags.

CONFINED SPACE ENTRY

All Contractors performing work involving "Confined Space Entry" as defined by FM O&G Operations Management shall be familiar and comply with FM O&G site-specified Confined Space Entry Permit procedures.

Confined Space Entry Permits shall be issued ONLY by FM O&G personnel, unless otherwise specified by FM O&G Operations Management.

All contract personnel involved in Confined Space Entry will have completed a Confined Space Entry training program meeting 29 CFR 1910.146, or applicable state regulations, prior

to performing any Confined Space Entry operations.

HOT WORK

All Contractors conducting “Hot Work” (welding, cutting, grinding, etc.) or other “Hazardous Work” as defined by FM O&G Operations Management are required to be familiar with and comply with FM O&G site-specific Hot Work Permit procedures. Contractors are to provide all tools and safety equipment (gas detectors, fire extinguishers, FR vest, etc.) for this work.

Hot Work Permits shall be issued ONLY by FM O&G personnel, unless otherwise specified by the region’s FM O&G Operations Manager.

HAZARD COMMUNICATION - CHEMICALS

Contractor shall be familiar with and comply with FM O&G site-specific Hazard Communication Program requirements and procedures.

FM O&G will provide to Contractor, upon request, an appropriate Safety Data Sheet (SDS) for hazardous chemicals maintained on site by FM O&G.

Contractor shall provide to FM O&G, upon request, an appropriate SDS for any hazardous chemical that Contractor brings on site. Such hazardous chemicals will be properly stored and marked in accordance with OSHA Regulations.

Contractor shall provide to FM O&G, upon request, an inventory of all chemicals stored, temporarily or permanently, on FM O&G property. The inventory is to include the type of container; minimum, maximum and average inventory; secondary containment type; number of days on site; and other requested information.

All hazardous chemicals brought on site by the Contractor are the property of the Contractor and it is the Contractor's responsibility to remove any unused chemicals or wastes generated by their use at the conclusion of the job.

Contractor shall provide to FM O&G, upon request, a copy of the contractor's written Hazardous Communication Program in compliance with 29 CFR 1910.1200 and/or local state OSHA regulations.

PROCESS SAFETY MANAGEMENT

All contractors performing work on or near a FM O&G facility governed by the Process Safety Management regulation (i.e. gas plants), 29 CFR 1910.119, will complete Process Safety Management training *prior* to performing any work at that facility. Operations Management will provide guidelines to the Contractor for that training.

DEPARTMENT OF TRANSPORTATION

All contractors performing work on or near a FM O&G facility governed by the Department of Transportation 49 CFR Parts 190-199 (pipeline) and/or 49 CFR Part 382 (commercial trucking) shall have in effect a Drug and Alcohol Prevention Plan which, at a minimum, meets the requirements of those regulations (49 CFR, Subpart 40).

HAZWOPER

All Contractors performing work regulated by OSHA's HAZWOPER regulation 29 CFR 1910.120 (spill response) or D.O.T.'s Hazardous Material regulations 49 CFR Parts 171-181 (transportation of hazardous materials) will have completed a training program at or above the level required for the work being performed.

TRAINING

Contractors are responsible for ensuring that their employees are trained in accordance with applicable federal, state, or local environmental, safety and health regulations, and that such training is documented. Such documentation may be subject to review by FM O&G at any time prior to, during, or after the completion of the work.

For more information, see the FM O&G *EH&S Management System*.

General Work Rules

Anyone in the work place who observes an action or condition that is unsafe has the obligation to intervene. This may include shutting the job down, correcting the condition or situation, communicating concerns or notifying appropriate supervisors.

Try to anticipate any hazards you might encounter while working alone. When working alone do not attempt to do a job which needs more than one person to do it safely.

Each individual has the responsibility to ensure that all safety instructions, directions, and other communications are clearly understood.

- Practical jokes, wrestling, water fighting, and all other forms of horseplay are strictly prohibited
- Never enter a designated chemical handling area without adequate protective equipment and training.
- Pits, depressions or low spots in the ground that contain any pipelines, valves, containers or equipment may pose hazards such as flammable gas, toxic vapors, oxygen deficiency, hazardous liquids and egress difficulties. Safeguards listed in Safe Entry Permit Procedures will be followed.

- Do not reach into any enclosure until you have assured yourself that it does not contain dangerous insects, animals or snakes.
- Look for and observe all warning, caution or danger signs.
- Do not climb any structures except on established ladders, stairwells, or walking surfaces, unless appropriate safeguards, e.g., lifelines, safety nets, etc., are used. Do not walk or climb on piping, valves, fittings or any other equipment not designed as a walking surface.
- Step or climb down from all elevated locations. Do not jump down!
- Keep wind direction and ground slope in mind at all times when in H_2S areas or around LPG storage vessels. In the event of fire or an unexpected discharge, your best route of escape is away from the problem, uphill and upwind direction from the source.
- Keep out of the path of moving or movable objects.
- Do not remove, displace, tamper with or destroy any safety devices, safeguards, notices or warnings unless duly authorized.
- Do not walk under loads being lifted by a crane, winch, etc.
- Flammable liquids shall not be used for cleaning.

SAFETY EQUIPMENT

All safety equipment including, but not limited to, hard hats, safety glasses, gas testers, monitors, respirators, hearing protectors, fire-fighting equipment, etc., shall be approved by the FM O&G designated Corporate EH&S Supervisor prior to purchase and use.

STAIRWAYS, WALKWAYS AND WORKING SURFACES

Walkways and grating shall be kept in good condition. All hazards shall be repaired immediately. If not, the section should be roped off or closed until repairs can be made.

Stairways, walkovers or ramps shall be installed where personnel must walk or step over pipe in the course of their normal duties.

All temporary openings in floors, decks, grating, etc., must be roped off or otherwise barricaded to prevent accidental falls.

HOUSEKEEPING

- *Good housekeeping is very important in a successful safety program.* Proper housekeeping will eliminate a number of serious hazards and will help your job run smoothly.

- Hazards such as slipping and tripping, dangerous accumulation of trash, and blocked escape routes will be reduced.
- Maintaining good housekeeping can *only* be accomplished if you make the effort to keep your job site clean and in proper order.
- Good housekeeping is your responsibility, not only in your designated area but wherever you travel through the facility.

For more information, see the FM O&G *EH&S Management System*.

Personal Protective Equipment (PPE)

The Company strives to provide a hazard free environment for employees. The purpose of protective clothing and equipment is to, as much as possible, shield or isolate individuals from chemical, physical, biological or other hazards that may be present in the workplace.

MINIMUM PPE REQUIREMENTS

All employees and contractors in work areas are required to wear:

- ANSI Z-87.1 rated safety glasses with sideshields
- ANSI Z-41 rated safety toe footwear
- ANSI Z89.1 Type 1, Class E hard hat
- Flame Resistant Clothing (FRC) manufactured to meet NFPA 2112

Work areas include all field locations, plants, shops, warehouses and storage areas not including parking lots and office buildings.

SAFETY GLASSES

Personnel who require corrective lenses must wear ANSI Z-87 rated prescription safety glasses or approved cover glasses or impact type goggles specifically designed to be worn over corrective lenses.

Personnel who wear contact lenses must inform their supervisors and co-workers that they wear contact lenses. Contact lenses are permitted if the lenses are used in conjunction with approved eye protection and as long as the employee is not engaged in any activity involving the use of chemicals.

Eye & Face Protection Selection

SPECIFIC ACTIVITIES		
Using Grinders	Flying particles	Face shield for face, goggles for eyes.
Using Pneumatic Tools	Flying particles	Safety glasses with side shields or impact goggles.
Inspecting and lighting fire boxes manually	Flying particles	Face shield for face, goggles for eyes.
Working near other persons who are doing work	Flying particles, dusts, mists, chemicals	Same PPE as the worker.

SAFETY FOOTWEAR

All ANSI Z-41 approved safety footwear is acceptable except: western style boots with a large heel and any sole containing taps or exposed nails. A low heel is recommended for any worker required to climb ladders. Soles are to be slip, chemical and oil resistant. A puncture resistant foot bed is recommended. Electrical workers should use safety footwear approved for electrical use.

HAND PROTECTION

Gloves appropriate for the hazard are to be worn to protect the user from injury or exposure to a hazardous substance.

Glove Selection Guidelines

GLOVE TYPE	PURPOSE	COMMON USES
Cotton/ Canvas Cloth	Protects from abrasion Provides warmth and cleanliness	Light work
Leather, Leather Reinforced	Protects from: ● Abrasions ● Puncture wounds ● Lacerations	Handling rough, rigid or abrasive materials such as wire-rope handling, grinding and blasting
Leather Reinforced with metal	Protects from: ● Cuts ● Abrasions	Handling edged tools for cutting, such as knives, chainsaws and skill saws
Leather Insulated or Heat Resistant	Protects from thermal burns (hot or cold)	Welding, operating/maintaining cryogenic equipment or equipment around engines, boilers and steam lines
Electrical Insulated	Protection from electrical burns and shock	Work on energized electrical equipment
Chemical Resistant	Protection from: ● Skin contact ● Skin irritation / absorption ● Burns	Handling chemicals such as acids, caustics and most hydrocarbons Refer to the chemical's SDS
Disposable Exam Gloves	Protection from: ● Bloodborne pathogens ● Mild detergents	First aid, emergency response, cleaning and as glove liners

HEARING PROTECTION

Employees working in posted work areas or any area where the noise level exceeds 85 dBA are required to wear appropriate hearing protection.

Hearing protection should be worn in areas that are not posted if: there is a potential for temporary elevated noise levels, such as when high pressure gasses are released, or; it is necessary to raise one's voice in order to talk to others at a distance of three feet or less.

When selecting hearing protection, select a device with a NRR (Noise Reduction Rating) that will reduce the noise level to 85 dBA or less. To determine the noise exposure level, subtract the hearing protection's NRR from the actual noise level in the work environment.

Disposable earplugs generally provide the highest NRR ratings. In extreme noise environments, earplugs may be used in conjunction with earmuffs.

FALL PROTECTION

Employees exposed to unprotected work heights over four feet shall use appropriate fall protection. Climbing and fall protection is provided in the workplace to minimize the risk of falls. Protection may be accomplished through the design of the facility and/or provision of personal safety gear. Fall protection equipment may include: full body

safety harnesses with appropriate lanyard(s); safety climbs; personnel lifts; and/or, safety nets.

A full body harness must be used whenever fall protection is required. Whenever a safety harness is used for fall protection, not hooked on to a ladder-climbing device, lanyards with shock absorbing systems must be used. When working at heights where it is necessary to disengage a lanyard to move around equipment or obstacles, a double lanyard ("100% tie-off") must be utilized to assure fall protection. All equipment must be worn according to manufacturers' recommendations. Equipment must be stored properly to prevent damage.

Refer to the FM O&G *EH&S Management System* for more details on the proper PPE for specific activities.

Flame Resistant Clothing

Most locations have the potential for conditions that could produce a flash fire or electrical arc burn. In order to minimize the potential for injury, the Company has established the following requirements for locations or task where these hazards exist.

PREVENTION

Flame Resistant (FR) clothing of the appropriate ***arc rating and NFPA 70E hazard risk category*** is required for employees and contractors working on energized electrical systems >50V.

While wearing FR clothing, shirts shall be buttoned up the front; all sleeves must be rolled down and buttoned at the wrists and shirt tails must be tucked into the trousers.

Personnel wearing FR clothing must wear FR as the outermost (i.e. jackets) layer. Garments worn under FR clothing must be FR rated, 100% cotton or 100% wool. They cannot be 100% nylon, 100% polyester or 100% acrylic. These materials may melt at high temperatures, even without direct flame contact, resulting in burns to the wearer.

Visitors to areas where these tasks are being performed must also wear equivalent rated flame resistant (FR) clothing. Visitors should be

restricted from these areas to the greatest extent possible.

When the use of FR clothing is required, a risk assessment with respect to heat stress should be done. Appropriate measures should be taken to manage this hazard when present.

EXCEPTIONS

The following work activities that require additional protective clothing are exceptions to the outer clothing requirement. In these situations, FR clothing shall be worn under the garment specified for the specific type of work:

- Chemical Handling – Chemical clothing and other PPE as specified in the Material Safety Data Sheet (MSDS) or by a Job Safety Plan (JSP)
- Painting – Flame Retardant disposable coveralls. Other PPE as specified in the Safety Data Sheet (SDS) or by a Job Safety Plan (JSP)
- While Wearing Rain Gear (non-electrical work only)
- Other – As specified in a JSA

For more information, see the FM O&G *EH&S Management System*.

Respiratory Protection

In the control of those occupational hazards caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used.

RESPONSIBILITIES

All employees and contractors working on FM O&G property shall follow the requirements of the FM O&G Respiratory Protection Program. Refer to the FM O&G *EH&S Management System* for full details.

BASIC SAFETY PROCEDURES

- Only Authorized and Trained Employees may use respirators. Those employees may use only the respirator that they have been trained on and properly fitted to use.
- Only Physically Qualified Employees may be trained and authorized to use respirators.

- Only the proper prescribed respirator or SCBA may be used for the job or work environment. Air purifying respirators (APR) may be worn in work environments when oxygen levels are between 19.5 percent and 23.5 percent; and, when the appropriate air-purifying cartridge, as determined by the manufacturer and approved by NIOSH, for the known hazardous substance is used. A Self Contained Breathing Apparatus (SCBA) will be worn in oxygen deficient and oxygen enriched environments (below 19.5 percent or above 23.5 percent oxygen).
- Employees working in environments where a sudden release of a hazardous substance is likely will wear an appropriate respirator for that hazardous substance.
- Only SCBAs will be used in oxygen deficient environments, environments with an unknown hazardous substance or unknown quantity of a known hazardous substance or any environment that is determined "Immediately Dangerous to Life or Health" (IDLH).
- Employees with respirators loaned on "permanent check out" will be responsible for the maintenance, sanitation, proper storage and security. Respirators damaged by normal wear will be repaired or replaced by FM O&G when returned.

- The last employee using a respirator and/or SCBA that is available for general use will be responsible for proper storage and sanitation. Monthly, and after each use, all respirators will be inspected, with documentation, to ensure its availability for use.
- All respirators will be located in a clean, convenient and sanitary location.
- In the event that employees must enter a confined space, work in environments with hazardous substances that would be dangerous to life or health should a respirator fail (a SCBA is required in this environment), and/or conduct a HAZMAT entry, a "buddy system" detail will be used with an Attendant within constant voice, visual or signal line communication. Employees will follow the established Emergency Response Plan and/or Confined Space Entry Program when applicable.
- Management will establish and maintain safe operating procedures for the safe use of respirators with strict enforcement and disciplinary action for failure to follow all general and specific safety rules.

For more information, see the FM O&G *EH&S Management System*.

Fire Prevention

Prevention is the best method of avoiding a fire and its tragic consequences. A conscientious effort must be made daily to practice fire prevention. To do this, it is important to know the principal causes of fires and ways to minimize them. The major causes of fire include electrical overloads or malfunctions, mental errors, poor operations and poor equipment maintenance. *You can eliminate most of these causes by using proper job planning, following proper work procedures and maintaining good housekeeping.*

Training will be provided for fighting fires at the incipient stage. Do not attempt fire suppression if the fire has spread beyond your level of training or the capabilities of the suppression equipment available to you.

FIRE PROTECTION

In the oil field, fire is one of the worst things that can occur. Obviously, everyone must work to prevent fires by utilizing safe work practices, including good housekeeping.

FIRE FIGHTING RESPONSE

- Call for help (notify your supervisor and the local fire department).
- Account for all personnel at the scene and be prepared to effect personnel rescue operations if necessary.

At no time should employees unnecessarily expose themselves to risk. For small fires, after calling for assistance, employees should attempt to extinguish the fire using portable fire extinguishers or fire water hoses, whichever is appropriate. For larger fires, the recommended actions after calling for help are:

- Activate emergency shut-down devices.
- Close all valves on lines providing fuel to the fire.
- Depressurize equipment in the vicinity of the fire.
- Begin fire-fighting actions within the abilities of the personnel and equipment at the scene.
- Assist the fire department in containing and extinguishing the fire.

All major facilities (including gas plants, offices, large compressor stations, platforms, urban sites, large oil cleaning facilities) shall have a pre-fire plan tailored for that facility. Hypothetical fire drills shall be conducted at least annually.

For more information, refer to the FM O&G *EH&S Management System*.

Environmental Protection

All employees and contractors are responsible for understanding the potential environmental exposures and risks associated with their workplace and for conducting their work in a sound environmental manner.

Specific exposures and risks come from:

- Generation and discharge of wastewater,
- Air emissions,
- Soil contamination, and
- Waste generation.

Further, all employees and contractors are responsible for disposing all waste in the prescribed manner and using resources in an efficient manner to minimize the generation of waste.

For more information, see the FM O&G *EH&S Management System* and local EH&S Department representatives.

Management of Change

This procedure provides a systematic method for managing changes in FM O&G operations so that the impacts of those changes are fully understood and our people, assets and the environment are protected from undue risk.

Likewise, it is to manage changes in FM O&G operations at a level appropriate to address increased scrutiny of regulatory agencies and the communities in which we operate.

It is to ensure that FM O&G processes and procedures that have been put in place following careful review and design evaluation are not compromised inadvertently. These processes and procedures should not be changed without justifiable and well thought-out evaluations.

Change is defined as a deviation from the current design specification.

For more information, see the FM O&G *EH&S Management System*.

JSA & Job Planning

The Job Safety Analysis (JSA) is the process of identifying/evaluating hazards and implementing control measures to eliminate or reduce the potential for an incident. A JSA will be required for all jobs.

The JSA is a group activity coordinated by the Facility Foreman or Person in Charge (PIC) of the project. All personnel involved with the project must be involved in the Job Safety Analysis process. They will ensure that the following is observed:

- The sequence of job steps is reviewed
- Hazards are identified
- Necessary safeguards are determined
- The assigning of responsible individuals
- The completion of the FM O&G JSA form (if a FM O&G employee job)

The Pre-Job Safety Meeting is to be held before work begins so that the actual work environment will be communicated and the crew will become familiar with the job. The completed form will be reviewed by all who will work on the particular job for which the JSA was developed. All affected personnel within the work area will abide by the JSA.

For more information, see the FM O&G *EH&S Management System*.

Work Permits

The purpose of a permitting system is to establish a systematic method for ensuring safe working procedures and conditions applicable to non-routine work, confined space entry, energy isolation and hot work.

Some locations will require the use of a General Work Permit. Check with the facility foreman before starting any work to determine if a General Work Permit is required.

A Hot Work Permit is required before beginning any work that could generate a source of ignition in an area where flammable gasses or combustible materials may be present. This may include opening instrument panels, use of cameras, or other non-classified instruments. A Hot Work Permit is required for all hot work outside of designated safe weld areas. Refer to the Hot Work section for more information.

A Confined Space Entry Permit is required for all confined space work. Refer to the Confined Space Entry section for more information.

For more information, see the FM O&G *EH&S Management System*.

Simultaneous Operations

Simultaneous Operations (SimOps) are defined as two or more operations carried out concurrently within a facility, including drilling, maintenance, production and /or construction activities. When these operations are conducted concurrently, they frequently conflict. This is particularly true when wells are being produced and hydrocarbons are present. Decisions may be made that come in conflict with other activity placing personnel and equipment in unnecessarily hazardous situations.

Safely performing simultaneous operations depends largely on the effectiveness of communications between departments. It is important that personnel at each work activity know what work is going on nearby and how it may affect their work. It is also important that work priorities are designated and communicated to all workers.

The Simultaneous Operations Liaison (SOL) will normally be the Facility Foreman, unless otherwise designated. In the absence of the Facility Foreman, the operations Person in Charge (PIC) will act as the SOL unless otherwise designated. The Drilling Representative is SOL on exploratory activities which are not part of a production facility.

A Simultaneous Operations Meeting is the preferred vehicle for communicating between operations. The

Simultaneous Operations Meeting and activity listing will be kept by the SOL. Each work unit supervisor will discuss the work to be performed that day. The SOL will note the priorities and any special restrictions. If a work supervisor arrives at the facility after the Simultaneous Operations Meeting, he / she will report immediately to the SOL upon arrival and brief the SOL on the work to be done that day.

For more information, see the FM O&G *EH&S Management System*.

Hot Work

A Hot Work Permit is always required before beginning any operation, tool or equipment capable of creating a spark or flame of sufficient temperature to ignite flammable or combustible material when outside of a designated safe welding area. Examples are: grinding, welding, cutting, using electric power tools, open flames, motorized equipment, static electricity from sandblasters and vacuum trucks, or other ignition sources in or near locations where flammable or combustible materials may exist.

The use of portable gas testing equipment to determine levels of flammable and toxic vapors or gases present in the atmosphere shall be used. This equipment shall be in good working order and calibrated according to the manufactures requirements. Testing shall indicate that no flammable vapors (<10% LEL) or toxic gases (<10 PPM H_2S) are detectable and a safe level of oxygen (≥19.5% and ≤ 23.5%) within 50 feet of where hot work is going to be performed. Testing equipment will be operated by personnel who have been trained in the techniques and use of portable gas testing instruments.

A person is to be designated as a Fire Watch whenever Hot Work is in progress outside of a designated safe welding area. This person is to have no other concurrent duties and is required to stay 30 minutes after hot work is completed.

The Fire Watch's primary function is to observe conditions in the immediate and adjacent areas to assure that hot work is performed safely. The Fire Watch is expected to be able to sound the alarm and immediately extinguish a fire should one occur. The Fire Watch is to wear a FR rated vest or other method that identifies them as the Fire Watch.

For more information, see the FM O&G *EH&S Management System*.

Lock-Out / Tag-Out

Equipment not properly locked and tagged out during maintenance or repair can cause serious injury. To guard against electrical shock, injury from movement, or other injury from power-driven equipment, proper lockout and tag-out procedures must be followed.

Normal production operations are not covered by this policy unless an employee must:

- Remove or bypass a guard or other safety device
- Place a part of their body in a danger zone associated with a machine process or operating cycle or
- Open a pressurized system.

No employee shall attempt to activate, energize, or operate any machine, piping, valves, or equipment that has been locked and/or tagged out for servicing or maintenance purposes. Any employee who willfully violates this policy will be subject to discipline.

The following are minimum general requirements:

- A Lock-Out and Tag-Out system will be required in all circumstances where electrical, steam, air, hydraulic or other type of energy may endanger personnel

- All electrical equipment will be discharged of any residual electrical charge and tested for voltage before performing any service work.
- Lock-outs must be made at the main power supply to the equipment only. Lock-outs of operating switches may leave other portions of the equipment energized. You can lock-out the main power supply and tag-out all operating switches or start-stop stations. In all situations, you must "try" to start the equipment to make certain it will not start.
- A physical disconnect of electrical feeder lines must be made in all instances where no common feed switch is provided to the equipment. The disconnect must be made at the feeder line source.
- Energy sources other than electricity such as steam, air, hydraulic, gas, etc. must be blinded disconnected, plugged, or some other positive means taken to prevent contact between employees and the power source.
- Do not disconnect switches when they are energized and under load; arcing phases may occur with explosive-like results.
- Where a fuse must be pulled, the supply (line) end must be pulled first and must be inserted first, never the neutral (load) side.

A worker must never remove another worker's personal lock and tag. Department locks may be

removed by anyone from the same department involved with the isolation. A Supervisor may remove one of his worker's locks and tags only if he receives permission from the worker.

In an emergency, a Supervisor may remove a worker's lock and tag without permission if unable to locate him. In all instances, the Supervisor assumes total responsibility for the worker's safety when removing the worker's lock and tag.

It is recommended that each worker be assigned his own lock. Padlocks will be keyed differently and a maximum of two keys will be provided for each lock -- one for the worker and the other to be retained by the Supervisor in a location accessible only by him.

Tags are a temporary means of warning all concerned of a hazardous condition, defective equipment, etc. Tags are not to be considered as a complete warning method but must be used until lockout can be employed and must be used in conjunction with locks at the lockout site.

Locks are the preferred mechanisms for the positive isolation of potential exposures. When an isolating device is locked out, a tag must be used as a supplement to warn against accidental or unauthorized operation. Where locks cannot be applied or are not feasible, tags alone may be affixed to isolating devices. In these cases, additional precautions will be

employed, such as removing fuses, blocking moving parts of machinery, inserting line blinds, disconnecting piping,

Tags will be standardized with a "Danger, Do Not Operate" or other appropriate title and will prohibit the unauthorized removal of the tag or operation of the isolating device.

Before working on any equipment, remember:

- ***Lock***
- ***Tag***
- ***Clear***
- ***Try***

Electrical Safety

These Electrical Safety guidelines provide guidance for safeguarding personnel and property from hazards arising from the use of electricity. All applicable codes and regulations must be followed when installing, maintaining, or repairing electrical equipment.

Most oilfield equipment operates on 440 volts or higher. Caution shall be used when working around any electrical equipment, especially in wet conditions. The following safety precautions shall be followed when working with or around electrical equipment:

- All FM O&G or contract employees working with or near electrical equipment must be trained appropriately.
- Only qualified and authorized employees shall work on electrical equipment. Contact your supervisor if you feel that you need additional training.
- All electrical equipment shall be properly grounded and / or bonded.
- Treat all electrical equipment as if it were energized.
- De-energize electrical circuits before work begins. Utilize the Lock-Out/Tag-Out procedures to avoid inadvertently activating electrical circuits.
- Only double insulated electrical tools or equipment shall be purchased and used.

- Inspect all tools, equipment and cords before placing them in service.
- Any faulty tools or equipment shall be immediately taken out of service and its condition reported to your supervisor.
- Make sure all portable electric equipment and extension cords are of the three-wire grounding type.
- Extension cords are designed for, and must only be used for temporary applications.
- Use Ground Fault Circuit Interrupters (GFCI) in all outdoor applications and in wet locations.
- Use only approved portable electrical equipment in areas where possible explosive vapors may exist.
- Do not overload circuits. Replace fuses and circuit breakers with properly sized fuses and / or breakers.
- Use proper tools and PPE, including proper arc flash protection.
- Do not wear metallic jewelry such as rings, bracelets and wristwatches while working near electrical equipment.
- Do not leave cover plates off of electrical connection boxes, pressure switches and similar equipment. Do not leave the door or front panel open on any motor controller or other electrical enclosure.

- Ensure all motors and electrical equipment are properly grounded and bonded prior to energizing.
- Avoid working on electrical circuits or equipment while clothing or shoes are wet, or while hands and feet are in water.
- When operating an electrical disconnect or switch, stand to one side. Do not stand directly in front of the switch box.
- Check motor control boxes, disconnect switch handles and electrical equipment with the back of hand before grasping them.
- When shutting down electric-motor-driven equipment for maintenance, open (turn off) the main switch and then press the start button to be sure the unit is de-energized.
- If the motor controller is remote from the motor or in a bank with other motor controllers, check to be sure you have shut down the right piece of equipment and follow the Lock-Out / Tag-Out procedures.
- Ensure that all equipment, motors and controllers are properly labeled and identified.

For more information, see the FM O&G *EH&S Management System*.

Bloodborne Pathogens

The purpose of this policy is to eliminate or minimize employee occupational exposure to blood or certain other body fluids.

The Company does not have designated personnel positions that require response to incidents requiring first aid. Employees responding to a first aid incident as a "Good Samaritan" or other worksite location where the exposure to bloodborne pathogens is likely, must utilize "Universal Precautions" in order to protect themselves from exposure.

Employees who are exposed to bloodborne pathogens or OPIM must wash thoroughly, after removing PPE, with soap and water immediately after the exposure. If soap and running water is not immediately available, wipe exposed areas with an antiseptic wipe from the first aid cabinet. Then, as soon as possible, wash with soap and running water.

All potentially infected PPE must be disposed of. Place potentially infected material in a plastic bag before disposal.

Report the exposure to your supervisor immediately. Refer to the FM O&G *EH&S Management System* for additional information.

Safety Showers and Eyewashes

Safety showers and eyewash stations are located throughout company facilities.

Before work begins, the nearest safety shower and eyewash station should be located and tested for proper operation.

Each shower and eyewash station shall be inspected at least weekly. The inspection shall include a survey of the area around the eyewash station to be sure it is accessible.

For detailed inspections procedures or for more information, refer to the FM O&G *EH&S Management System*.

Heat and Cold Stress

It is the responsibility of each Facility Manager and Supervisor to take into consideration the combined effects of working and environmental conditions when planning and conducting operations.

Heat Stress Prevention

- Drink plenty of fluids (preferably water) throughout the day
- Aid natural ventilation whenever possible with fans or similar equipment
- Provide shelter to protect personnel from direct sunlight when possible during work periods and rest periods
- Take breaks when necessary
- Plan strenuous work activities for early morning or late evening
- Rotate workers frequently when they are wearing protective clothing
- Provide time to acclimate to elevated temperatures when transferring from an assignment having a temperate geographical location to a hot location
- Self-monitor the color and quantity of urine to determine requirements for fluids. Generally, it should be colorless and be passed at least 5 times per day. The quantities of salt normally consumed with food should be adequate

Cold Stress Prevention

- Wear adequate clothing to maintain body heat when working in cold environments. A number of thin layers of clothing which trap layers of air provide better insulation than one thick layer.
- Hard hat liners should be worn.
- Stay dry; if you get wet, change your clothing immediately.
- Adequate shelter should be provided for personnel to utilize when they need to get warm.
- Take short, frequent breaks in a warm environment when necessary.

For more information, see the FM O&G *EH&S Management System*.

Hazard Communication - Chemicals

The purpose of the Hazard Communication Program is to advise all employees and contractors of the hazardous chemicals to which they may be exposed during the course of their work.

The Hazard Communication Program includes:

- Chemical Inventory listing of all hazardous chemicals that are used by FM O&G.
- Labeling system used by FM O&G. All chemical containers are to be properly labeled.
- Training Programs for employees as outlined in the Hazard Communication Program in The FM O&G *EH&S Management System*.
- Safety Data Sheets (SDS), which are available 24 hours a day for your review. The SDS should be reviewed prior to using a chemical.

Flammable and Combustible Liquids

Flammable and combustible liquids and their vapors/mists can be extremely hazardous if proper procedures are not followed in their handling, transportation and storage. All flammable and combustible liquids shall be handled with caution as outlined in the Safety Data Sheet (SDS). Appropriate Personal Protective Equipment (PPE) shall be utilized when handling flammable and combustible liquids.

Only approved containers (DOT, UL, ASTM or NFPA) shall be used when transporting or storing flammable and / or combustible liquids. All containers containing flammable and combustible liquids shall be properly labeled according to the respective Material Safety Data Sheet and the FM O&G Hazard Communication Plan.

Flammable and combustible liquids shall not be transferred while the container is inside a motor vehicle.

All chemical storage areas shall be so designated by a yellow line around the area or appropriately worded signage on all four sides of the storage area. The MSDS shall be readily available for all chemicals handled, produced, or stored at that particular location.

For more information, see the FM O&G *EH&S Management System*.

Steam Handling

All safety requirements for working with high-pressure gas apply to steam.

Uninsulated hot lines shall be labeled with a caution sign. Guards should be installed if contact by personnel is likely on lines with a surface temperature exceeding 160º F.

Insulated gloves shall be worn when handling hot equipment or when working where there is a danger of hot surfaces.

Pressure is to be removed before repairs or work is performed on a line or fitting. Just because a steam line is cold does not indicate that there is not pressure on it.

When steam is allowed to flow into a cold line, the block valve should be opened slowly and care exercised to allow the line to gradually assume its working temperature and pressure. Steel expands approximately ¾" per 100 feet per 100º F change in temperature.

For more information, see the FM O&G *EH&S Management System*.

Naturally Occurring Radioactive Material (NORM)

Naturally Occurring Radioactive Material (NORM) presents a potential hazard due to overexposure to naturally occurring ionizing radiation.

The source of most of the radioactive isotopes in NORM are formed by the decay of Uranium-238 and Thorium-232, which are naturally present in many oil, gas and water producing formations.

DESIGNATED RADIATION AREAS

Work or storage areas where surveys have indicated a radiation level above 50 μR/hr (microrems per hour) above background shall be designated as radiation areas.

SIGNS

50 μR/hr - All equipment where surveys have indicated a radiation level above 50 μR/hr above background are to be posted with a caution sign that has the radiation symbol and reads:

CAUTION
Contains Naturally Occurring
Radioactive Materials

5,000 μR/hr - All equipment where surveys have indicated a radiation level above 5,000 μR/hr 30 centimeters from the source above background are to be posted with a caution sign which has the radiation symbol and reads:

CAUTION
Radiation Area

PPE

All personnel performing work on radioactive equipment or in a known or suspected radioactive area must wear PPE to minimize exposure.

To control exposure, the following factors must be considered: Time, Distance and Shielding.

- Time: Minimal time will be spent working with or around NORM contaminated equipment.
- Distance: As distance is increased between the individual and the NORM contaminated equipment, exposure levels decrease dramatically. Maximum distance is to be maintained between the contaminated equipment and personnel.
- Shielding: Due to the low levels of radiation that are encountered with NORM contaminated equipment, shielding is not necessary. However, to prevent ingestion, absorption and inhalation of radioactive particles, it is necessary to use appropriate PPE.

The minimum compliment of PPE when working with NORM contaminated equipment above 50 μR/hr and below 100 μR/hr is a hard hat, safety glasses with side shields, rubber gloves, rubber safety boots and coveralls.

For radiation levels above 100 μR/hr, the addition of a cartridge respirator with a P100 filter, goggles and Tyvek® coveralls is recommended.

A cartridge respirator with a P100 filter, goggles and faceshield are required whenever airborne particles may be present. This may occur during dry scraping, cutting, grinding or other physical removal methods.

No work is to be done on equipment with radiation levels above 100,000 μR/hr. Contact the FM O&G EH&S Department before proceeding.

HYGIENE

Personnel are to thoroughly wash before eating drinking or smoking. Eating, drinking and smoking are not to take place in a NORM contaminated area.

For more information, refer to the FM O&G *EH&S Management System*.

Hydrogen Sulfide Safety

Hydrogen Sulfide (H_2S) is a highly toxic, colorless (transparent), flammable gas that is heavier than air. Hydrogen Sulfide can paralyze your breathing system and kill you in minutes. In small amounts it is dangerous to your health.

At low concentrations H_2S has an offensive odor similar to rotten eggs. At slightly higher concentrations, H_2S may have a sick-sweet odor. At high concentrations no odor can be detected because H_2S rapidly deadens the sense of smell by paralysis of the olfactory nerve. Consequently, *the sense of smell cannot be depended upon to detect H_2S!*

H_2S is heavier than air (vapor density = 1.18). On still foggy days it tends to accumulate in low places in dangerous concentrations. H_2S tends to follow a path similar to water; it flows downwind and downhill and will tend to pool in low or quiet spots. However, if it is warmer than the surrounding air when mixed with natural gas, it may rise.

HOW H_2S AFFECTS AN INDIVIDUAL

When a person breathes in H_2S it goes directly through the lungs and into the bloodstream. To protect itself, the body oxidizes (breaks down) the H_2S as rapidly as possible into a harmless compound. If the individual breathes in more H_2S than can be processed by the body, the H_2S builds up in the blood and the individual becomes

poisoned. The nerve centers in the brain which controls breathing become paralyzed. The lungs stop working and the person is asphyxiated.

At **Low Concentrations,** H_2S may cause irritation of eyes, nose and throat.

At **Moderate Concentrations,** H_2S may cause excitement, headache, dizziness, nausea, vomiting, coughing and loss of equilibrium.

At **High Concentrations**, H_2S may cause rapid loss of consciousness and death may result unless the victim is moved to fresh air and first aid is administered. Follow ABC's for first aid; page 16.

DETECTION OF H_2S

Although H_2S has a characteristic "rotten egg" odor in low concentrations, the sense of smell cannot be relied upon for detection because the sense of smell is lost in a few minutes exposure at moderate concentrations and in less than a minute at high concentrations. Hydrogen Sulfide can only be accurately detected with direct reading instruments or colorimetric detector tubes. Use of Personal Monitors may be required in some areas.

RESPIRATORY PROTECTION

Respiratory protection must be utilized in areas where exposures may exceed either 10 ppm

averaged over an 8 hour period, or 15 ppm averaged over 15 minutes.

Only a Self-Contained Breathing Apparatus or other Supplied Air Respirator may be used in an H_2S environment. Never use a cartridge or other air-purifying respirator.

USE THE BUDDY SYSTEM

When possible, personnel should work in pairs, utilizing the Buddy System, in areas of likely exposure to high concentrations of H_2S. The use of the Buddy System is mandatory whenever personnel will be directly exposed to atmospheres above 100 ppm, even if respiratory protection is being utilized

Toxic Effects of Hydrogen Sulfide (H_2S) Gas		
1-10 ppm	Rotten Egg Smell	8 Hour Exposure Level TLV-TWA, PEL
15 ppm	Rotten Egg Smell	15 Minute Exposure Level TLV-STEL
50 ppm	Eye irritation, coughing	Maximum Exposure Level TLV-C
100 ppm	Loss of sense of smell	IDLH
500 ppm	Coughing; Respiratory Disturbances; Unconsciousness	
1000 ppm	Immediate loss of consciousness; Death in a few minutes	

Materials Handling

You need to follow the proper procedures when handling materials with lifting equipment or manually. Always do a complete inspection of the equipment and tools you will be working with. Material handling requires the use of various pieces of equipment. Each should be operated in a manner as to be safe and prevent incidents from spills or releases.

When working with a winch truck make sure that you never stand under the load or put yourself between the truck and any solid obstruction. Make sure loads are properly secured and will not come in contact with any overhead power lines or obstructions. Dollies and handtrucks should never be overloaded or stacked above eye level.

Proper lifting and carrying techniques should be used when moving any materials manually. Make sure the area around you is clear of anything that might cause a trip and fall. Never over exert yourself get help with loads that might be too bulky or heavy.

For detailed information, please refer to the FM O&G *EH&S Management System*.

Back Safety and Manual Lifting

Employees and contractors have the responsibility to utilize mechanical lifting devices when available and when the size, shape and weight of the object justify their use, instead of attempting to lift the object manually.

When manual lifting cannot be avoided, Employees are to follow these safe lifting practices:

- Inspect the area around the object to be lifted. Scan expected transportation routes for any obstruction or spillage
- Inspect the object for burrs, jagged edges, rough or slippery surfaces
- Keep hands free of oil and grease.
- Keep fingers away from pinch points
- Use correct body position for lifting:
  - Stand behind object to lift.
  - Keep feet parted - one alongside, one slightly back to give thrust to the body
  - Keep back straight
  - Grip the object with the whole hand.
  - Look forward
  - Lift with legs, not back
  - Tuck elbows and arms in close to the body
  - Hold object close to body
  - Scan the direction of travel

For more information, see the FM O&G *EH&S Management System*.

Commercial Vehicles and Construction Equipment

OPERATOR RESPONSIBILITIES

- Operating Vehicle in a safe manner.
- Using the vehicle only for the purposes for which designed.
- The safety of his passengers or helpers
- The safety of anyone helping load or unload.
- All Operators shall drive company equipment in accordance with the law and maintain a valid driver's license. Operators are personally responsible for the consequences of violations.
- Operators of assigned company vehicles should routinely check the condition and operation of the following: seat belts, tires, horn, brakes, windshield wipers, steering gear, windshields, headlights, taillights, turn-signals, stop lights, gasoline, oil, radiator, transmission and battery fluids.
- Operators shall not operate company equipment which is defective or not in compliance with the law.
- No one under the influence of intoxicating beverages or drugs is allowed to operate a company vehicle.
- Hitchhikers are prohibited in company vehicles.

- Operate company vehicles and equipment in a defensive manner. Always be on alert and try to anticipate what might occur under the existing conditions.
- Operator shall be considerate of the traveling public and/or pedestrians and shall yield the right of way.
- Operators shall drive at speeds consistent with surrounding conditions and posted limits.
- Operate at all times with sufficient space around your vehicle to provide time to see conflicts arising, to react quickly and to stop.
- Operators and all passengers shall have their seat belt fastened whenever a vehicle is in motion.
- Use of cell phones while driving is discouraged and is prohibited in some onshore facilities.

EQUIPMENT GUIDELINES

- Operators of construction equipment and heavy vehicles such as backhoes, forklifts, graders, loaders, farming equipment, etc. must be qualified, by licensing for that particular equipment, and by demonstration of skills before operating company equipment.
- Never get under a backhoe bucket or reach through the lift arms when the bucket is raised.

- Use care in attaching tow lines to the backhoe.
- Standing under any suspended load is strictly prohibited.
- Heavy equipment always has the right of way.
- Any rider other than the operator is prohibited.
- Locate utility lines and overhead power lines before starting to dig. Do not operate a backhoe within 10 feet of overhead electrical lines.
- Never attempt to lift loads in excess of the backhoe capacity.
- All safe starting, backing and parking guidelines are to be followed.
- In the event of a breakdown, vehicles or equipment shall be parked with all wheels off the main roadway, if possible

Spotter Hand Signals

Move Back

Move Forward

Cleared to Leave

Move Left

Move Right

Cleared to Leave - Directional

Distance to Stop

Stop

INCIDENT

All incidents are to be reported to your supervisor as soon as possible

For detailed information, please refer to the FM O&G *EH&S Management System*.

Forklift Safety

SAFE OPERATING PROCEDURES & RULES

- Only authorized and trained personnel will operate forklifts or other powered industrial trucks (PITs).
- All PITs will be equipped with a headache rack, fire extinguisher, rotating beacon, backup alarm and seat belts. Seat belts shall be worn at all times.
- The operator will perform daily and pre- and post-trip inspections.
- All PITs will be operated on the surface for which they were designed.
- Any safety defects will be reported for immediate repair or have the PIT taken out of service.
- Operators will follow the proper recharging or refueling safety procedures.
- Loads will be tilted back and carried no more than 6 inches from the ground. Loads that restrict the operator's vision will be transported backwards.
- PITs will travel no faster than 5 mph.
- PIT Operators in high lift areas will always wear hard hats.
- Operator will sound horn and use extreme caution when meeting pedestrians, making turns and cornering.

- Passengers may not ride on any portion of a PIT. “NO PASSENGERS” decals will be affixed on all PITs.
- If PITs are used as a man lift, an appropriate man lift platform will be used.
- Lift Capacity will be marked on all PITs.
- When un-attended, PITs will be turned off, forks lowered to ground and parking brake applied.
- When loading rail cars and trailers, dock plates will be used.
- Operators are instructed to report ALL incidents to Management.

For detailed information on pre-qualification, training, maintenance refer to the FM O&G *EH&S Management System*.

Crane Operating Procedures

The purpose of this section is to insure safety to personnel and equipment during crane / hoisting operations. This section will not attempt to address all precautions necessary for every crane operation, but will provide some basic safety guidelines. Additional information can be found in the FM O&G *EH&S Management System* and guidance.

QUALIFICATIONS

Qualified crane operators are required to carry current training certification or licenses as well as Medical examination cards. Re-certification shall occur prior to expiration date to remain authorized to operate.

INSPECTIONS

The crane shall be inspected daily prior to operation to be sure all components are functioning properly. This applies to the slings and other riggings as well.

Logs are kept daily, monthly, quarterly and annually for inspections.

CRANE OPERATOR RESPONSIBILITIES

The crane operator shall designate *one* signalman. However, all personnel working in the area who may be required to signal in the crane operator should know the signals. The crane

operator shall respond to signals only from the appointed signalman, but shall obey a “STOP” signal at any time, no matter who gives it.

The crane operator shall determine that no high tension electric wires come within 10 feet of the parts of mobile cranes, A-frames, etc. If the 10 feet clearance is not possible, the power line must be de-energized or the line moved to provide a safe location prior to commencement of the job.

Loads shall not be moved above personnel.

When setting outriggers, the crane operator is to:

- Ensure that all personnel are clear of the outriggers.
- Have a clear view of outriggers.
- Switch control stations (when available) in order to ensure that the area is clear for the outriggers.
- If the operator cannot change positions, the rigger is to clear the area of all personnel while the outriggers are being lowered and the rigger is to be in clear sight of the operator.

SAFE OPERATING PRACTICES

Slings

Whenever any sling is used, the following practices shall be observed:

- Slings that are damaged or defective shall not be used.
- Slings shall not be shortened with knots or bolts or other makeshift devices.
- Sling legs shall not be kinked.
- Slings shall not be loaded in excess of their rated capacities. A tag attached to the sling shall indicate its rated capacity.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Slings shall be securely attached to their loads.
- Slings shall be padded or protected from the sharp edges of their loads.
- Suspended loads shall be kept clear of all obstructions.
- All employees shall be kept clear of loads about to be lifted and of suspended loads.
- Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- Shock loading is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling.

Lifting Attachments:

- Lifting pad-eyes are required on all skid mounted and / or packaged equipment that is too large or too heavy to be placed in a cargo basket. This includes equipment such as, but not limited to, wire line units, pump skids, and sand hoppers. When pad-eyes cannot be attached directly to the skid, lifting cages may be used. Lifting cages shall be constructed of carbon steel by a certified welder and shall be rated to handle the load in which it is attached.
- Lifting pad-eyes shall be fabricated from carbon steel plate when attached to carbon steel on the equipment skid.
- Design of the lifting pad-eyes shall allow the use of screwed pin safety shackles to attach slings.
- Design of the pad-eyes and welds shall incorporate a minimum safety factor of three (3).
- All pad-eye welds shall be done by a certified welder and shall be visually inspected before loading equipment for delivery to the Company.
- Lifting pad-eyes on equipment shall be positioned so slings cannot hang up causing equipment damage.

- Lifting cage joints not welded (bolted, screwed fittings, etc.) to the skid must be checked for tightness prior to each lift. Joints bolted on lifting cages should have anti-backing devices such as double nut or safety pinned. Screwed fittings should be pinned or locked in place and must be designed and/or rated to handle the load in which it is attached.
- All cargo baskets and equipment skids shall have a maximum load rating sign affixed and readable.

SYNTHETIC FIBER ROPE SLINGS

Synthetic Web Slings

For sling identification, each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

Webbing

Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

Sling Use

Synthetic web slings shall not be used with loads in excess of the rated capacities and never used for or stored near corrosive materials.

TAG LINES

- When safe to do so, a tag line must be used to control loads.
- Before the hook is moved, personnel using tag lines must be sure the lines are free with no knots.
- Tag lines must not be wrapped around the hand or wrist.
- The operator, signal person, and load handlers are responsible for ensuring that the load is never over any person.

SIGNAL PERSONS

A qualified signal person(s) must work with the hoist or crane operator when:

- Personnel assisting with the load are out of the range of the operator's vision.
- The moving load is out of the range of the operator's vision.

Standard signals should be used, refer to signal chart on last page of this section.

Normally, the signal person should give all signals; however, the operator should obey an emergency stop signal given by anyone.

GENERAL PRECAUTIONS

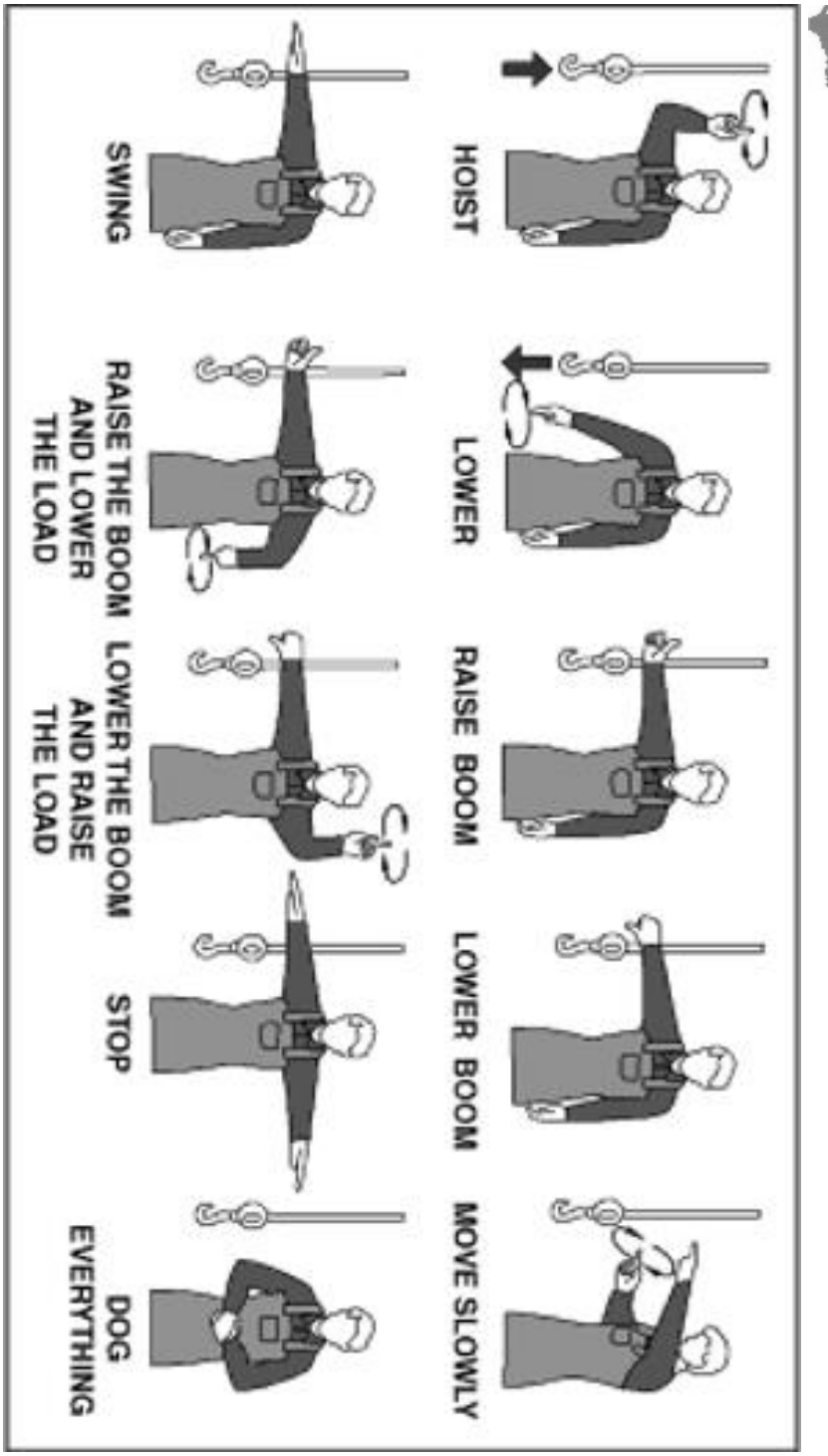
If your job assignment has you working in the area of crane operations, such as a rigger for the

crane, you should keep the following precautions in mind:

- The crane shall never be overloaded. Be sure the proper load chart is posted in clear view of the operator, and never attempt to pick up a load about which you are unsure.
- Never ride the “headache” ball (connected to the fast line). If lifting of personnel is required, an approved personnel-carrying device shall be used.

  NOTE: If lifting of personnel is required, the crane must be certified as such.

- The hook should be positioned directly over the load to avoid a side thrust on the boom and to prevent the load from swinging.
- All running hooks shall have keepers or safety latches. When possible, use shackles instead of hooks.
- Lift cables shall not be wrapped around the load. Slings or chokers should be used.
- Sharp corners of the load should be padded where they contact slings.



Remember: "Look Up and Live"

Drilling / Workover Safety

GENERAL

- ANSI approved hard hats, safety glasses (with sideshields), safety toe footwear and FRC must be worn while on drilling / workover locations.
- Personnel must be fully clothed at all times (sleeved shirts, long pants, coveralls, etc.) when in the work area.
- Derrickman emergency escape device must be in place and securely anchored.
- All rigs must have fire extinguishers, first aid kits and eyewash stations located so they are readily accessible. Each must be conspicuously marked and periodically inspected.
- Drilling in a hydrogen sulfide zone requires special precautions. The drilling rig must be equipped with a fixed monitoring system capable of :
- Detecting low levels of H_2S and
- Activating an audible and visible alarm.
  In addition to the fixed system, a portable detector must be available on location. All personnel working on location must have completed approved H_2S training given by a qualified instructor within the past 12 months.

- Discharge lines and hoses, temporary lines, pressure relief vent lines and all lines that are subject to high pressure must be securely anchored / hobbled.
- Field welding is prohibited on tongs, elevators, bails, blowout preventers, or other heat-treated equipment.
- Hot work performed outside of designated safe weld areas must utilize a Hot Work Permit.
- Electrical wiring, tools and equipment must be of the appropriate electrical classifications for the area in which they are located.
- Spilled materials that could cause slipping must be cleaned up as soon as practical.
- Pipe thread compound will be lead free.
- The FM O&G Rig supervisor must ensure that:
- The contractor's BOP equipment conforms to Blowout Prevention and Well Control practices, or
- The FM O&G drilling manager has approved an exception in writing.

RIG MOVES

The FM O&G Drilling or Production Superintendent, or designated contractor, will drive or walk the route to the new location with the rig toolpusher prior to the rig move. The route

is to be examined for height, width and possible weight restrictions.

If the route selected takes the rig under any overhead electrical or communications lines, a representative from the FM O&G electrical department will be included in the Planning phase of the rig move. On the day of the move, they will be onsite and will monitor all travel underneath identified lines. If necessary, they will move the line to provide adequate clearance. No one in drilling is to move an electrical or communication line.

RIG SKIDDING

An approved subsurface safety device must be installed in the tubing on all offshore producing wells or proper waiver obtained before skidding a rig offshore.

INSTALLING ANCHORS

Both permanent and temporary anchors must be installed in a pattern consistent with the minimum spacing (not load) requirements of API Specification 4F. A Dig Alert or One Call (811) is required before installing anchors.

Metal components of permanent anchors must be protected against corrosion.

FALL PROTECTION

Fall protection must be worn at all times when personnel are working more than 6 feet above the ground or adjacent floor/platform, such as when climbing or working in the derrick, substructure, etc. The safety harness must be securely fastened to a substantial support by a shock-absorbing lanyard.

DERRICKS

- Personnel are not allowed to ascend or descend any derrick or gin pole by riding the traveling block, drill pipe, elevators, or cat line
- Drilling and workover derrick ladders must be equipped with a climb assist / control descent or fall arrest device(s).
- Both hands must be used when climbing a ladder or any elevated structure. Tools needed should be carried in a bag or sack strapped over the shoulder or otherwise secured to the person.
- Safety inspections of the drilling and workover rigs must be conducted before being put in service after moving to a new location and at least monthly thereafter.

COMPRESSED AIR SYSTEMS

- Air compressor and air receiver tanks must be equipped with pressure relief valves. These valves must be tested periodically. Block valves should not be placed between

the air receiver tank and pressure relief valve. At locations where block valves are required, the valves should be secured or locked in the open position.

- Pressurized lines equipped with Chicago couplings must be secured with safety pins to prevent them from coming loose.
- Automatic starting compressors must have a sign stating that the unit starts automatically.

DRILLING HOSE

Drilling hoses must have clamps / chains at each end and securely attached to the gooseneck and standpipe.

MUD MATERIALS

Mud materials containing asbestos or sodium dichromate must not be used.

RELIEF VALVE INSTALLATION AND MAINTENANCE

A properly rated pressure-relief valve must be installed between the pump and shut-off valve on any rig positive displacement pump (i.e. mud pump) discharge hose or line. The relief valve must be cleaned and tested periodically to maintain serviceability.

TONGS

- The proper size of tong jaws must be used on each size of pipe.

- DO NOT stand on tongs while working above the rig floor.
- Tong dies, slip segments and snub lines must be checked on each tour and before each trip.
- Power tongs should be adjusted to a height that enables the operator to stand flat-footed on the rig floor or on a secure false floor. DO NOT use ladders, boxes or stools.
- Power tongs should be disengaged from drill pipe prior to any pipe movement.
- Tongs, air hoists and cathead sheaves in the derrick should have safety chains/lines installed.

ROD HANDLING

- A function test on rod hook latching mechanisms should be completed before every job.
- Personnel must keep their feet from under rods when hanging rods in the derrick.
- The use of rod wheels is universally accepted and proven to be safer than the use of pipe wrenches. The use of pipe wrenches in this application has caused serious injury to personnel.
- A rod wheel is to be used for rotating sucker rod, getting on and off a standing valve and rotating rods with fishing tools.

- Pipe wrenches are NOT to be used for these purposes.
- If additional torque is needed, use a back-off tool and hydraulic tongs.

WEATHER

There are times when high winds or lightning make it hazardous to pull or run pipe. When this occurs, the work should be suspended and the rig secured, depending on the downhole conditions. The supervisor should use good judgment.

ELECTRICAL

- Rig wiring must be installed in such a manner to protect it from abrasion and being crushed or run over by equipment / vehicles. Wiring must be insulated to resist weather, chemicals, and handling, and must be replaced if insulation is damaged. If it is necessary to repair damaged electrical cable, the repaired section should have an insulating quality equal to that of the original cable.
- Explosion-proof equipment must be used in Class I and II areas.
- Proper Lock-Out / Tag-Out procedures must be followed.
- Electrical switchgear must identify the piece of equipment it controls.

HOUSEKEEPING

- The work area must be maintained in an orderly manner.
- Tools and equipment must be stored when not in use.
- Stairways must be maintained with handrails and free of slipping / tripping hazards.
- Proper containers shall be provided for the collection of waste, trash and oily waste.
- Piping shall be properly stored on racks and chocked to prevent movement.

SMOKING AREAS

Smoking must be limited to appropriately marked designated areas at least 100 feet from the well bore.

SPECIAL OPERATIONS

For detailed workover and drilling safety policies and special operations information, refer to the appendices in this manual and the FM O&G *EH&S Management System*.

Process Safety Management

The Process Safety Management (PSM) Program has been established by FM O&G to protect company and contract personnel, surrounding community and property by preventing or minimizing the consequences of catastrophic releases of flammable chemicals.

Where PSM facilities exist within FM O&G, management and employees will apply principles of PSM to identify, evaluate and reduce unacceptable operating risks associated with a production facility, preventing fires, explosion, toxic releases and spills.

OPERATOR & CONTRACTOR QUALIFICATION

PSM operators must be certified as a qualified operator. Certification is accomplished using initial and refresher Qualified Operator training. Training shall include, but is not limited to, the following:

- PSM Process overview
- Unit Operations training
- Safe Work Practices / Safety Standards
- Emergency Response and Evacuation
- Safety and Health standards
- Mechanical Integrity
- Facility Safety Systems (including Operating Procedures)

MANAGEMENT OF CHANGE

A written Management of Change procedure has been established to manage changes to process chemicals, technology, and equipment; and changes to facilities that affect a covered process. This may include changes to piping, instruments, valves and operating parameters. Refer to your facility's PSM manual for more information.

PLANS AND PROCEDURES

Written plans and operating procedures will be implemented for all PSM facilities. Specific requirements and procedures can be found in your facility's PSM manual.

Confined Space Entry

This program is designed to ensure that safe work practices are utilized during all activities involving confined space work activities to prevent personal injury and illness that could occur. Work with local EH&S representative for all Permit Required Confined Space entries.

CONFINED SPACE

A space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and,
- Has limited or restricted means of entry or exit (for example: tanks, vessels, storage bins, hoppers, vaults, trenches, well cellars and pits); and,
- Is not designed for continuous employee occupancy.

PERMIT REQUIRED CONFINED SPACE

A space that meets the definition of a Confined Space, plus has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere.

- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazards.

The procedures followed for preparing, issuing, and canceling entry permits include the following elements:

- Obtain all necessary tools and safety equipment to conduct the job. Prepare job site for entry.
- Barricade off work area. Place sign or tag reading "DANGER – Permit Required Confined Space, Do Not Enter" or similar wording at each opening:
- Prior to opening space
- When it is not safe to enter
- Prior to issuance of Permit
- At the end of each shift when the space is not closed or returned to service
- Obtain a permit from Supervisor and complete entrant/attendant sections with the entry team. Acknowledge all have required training.
- Discuss job sequence and all hazards.
- Check out all tools and safety equipment.
- Lock-Out/Tag-Out all energized equipment and flowlines.

- Analyze atmosphere for oxygen content, flammable gases, toxics and other recognized hazards. DO NOT ENTER SPACE TO ANALYZE ATMOSPHERE!
- Prior to vessel entry, check external radiation levels, if applicable. Personal dosimetric monitoring required if exposure exceeds 50 μR/hr.
- Start ventilation equipment and ventilate. In tanks, ventilate sufficiently to exchange air at least twice. Recheck atmosphere.
- Take the completed permit to the entry supervisor for approval.
- Supervisor reviews completed permit and approves. Site inspection may be required before approval.
- Hang copy of the signed permit at job site.
- The duration of the permit is not to exceed the time of one work shift, unless all members of Authorized Entrants and Attendants are working overtime to complete job.
- At completion of the job, sign off permit and turn in to supervisor.
- The permit can be canceled anytime by supervisor.
- Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revision to the Permit Required Confined Space program can be made.

EQUIPMENT

To ensure the safety and health of employees, the following equipment is provided to all employees who work in or near permit spaces:

- Ventilation equipment
- Respirators - SCBA or supplied air with an egress bottle
- Full body harness with a lifeline
- Air monitoring equipment
- Fire Extinguishers
- First Aid Kits
- Radio communication
- Signage (as required)
- Hand Tools
- Escape Ladders for depths of four feet or more or shoulder height, whichever is less
- Rescue Tripod for vertical (top) entry
- Required PPE

ATMOSPHERIC MONITORING

At a minimum, the internal atmosphere will be tested, with a calibrated direct reading instrument, for the following in this order:

Oxygen Content – O_2	(19.5% - 23.5%)
Flammable Gases – LEL	(<10% LEL)
Hydrogen Sulfide – H_2S	(<10 ppm)

Other substances that may need to be monitored:

Carbon Monoxide – CO	(<35 ppm)
Light Hydrocarbon Vapors	(<300 ppm)
Benzene - C_6H_6	(<1 ppm)
Toluene - $C_6H_5CH_3$	(<100 ppm)
Temperature	(<110ºF)
NORM	(<50µR/hr)
Pyrophoric Iron	Visual Inspection

Other materials as specified by Entry Supervisor or the EH&S Department.

NOTE: Atmospheric concentrations listed are the PEL or TLV-TWA for that substance. Exposures greater than eight hours will require a reduced exposure without breathing apparatus. Temperatures above 100ºF will require additional ventilation to cool Entrants and will be limited to thirty-minute work periods with a minimum of 15-minute rest periods between work periods.

Atmosphere in a Permit Required Confined Space not meeting the above listed parameters and falling within the boundaries outlined, for listed hazards only, will require additional approval from the Production Manager or EH&S Department prior to entry.

Oxygen Content – O_2	(16.5% - 19.5%)
Flammable Gases – LEL	(11 - 20% LEL)
Hydrogen Sulfide – H_2S	(11 - 20 ppm)
Carbon Monoxide – CO	(36 - 50 ppm)

NOTE: A SCBA or SAR with egress bottle is required for the above conditions.

Entry is prohibited at the atmospheric conditions listed below except for rescue and only when a viable rescue method is determined prior to entry and trained rescuers are utilized.

Oxygen Content – O_2	(<16.5% - >23.5%)
Flammable Gases – LEL	(>20% LEL)
Hydrogen Sulfide – H_2S	(>20 ppm)
Carbon Monoxide – CO	(>50 ppm)
Temperature	(>110ºF)

Results of testing will be recorded on the Permit prior to entry and in the Air Test Log at intervals specified by the Entry Supervisor.

When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope will be tested a distance of approximately four feet in the direction of travel and to each side. If a sampling probe is used, the Entrant's rate of progress will be slowed to accommodate the sampling speed and detector response. If possible, test each level of a stratified atmosphere prior to entry using a remote sensor.

PERMIT CLOSING

Upon completion of work in a permit space, the following procedures are used to close off the Space and cancel the Permit:

- Authorized attendant ensures all entrants are out of permit space.
- Entrants ensure all tools and equipment have been removed from permit space.
- Work team ensures that process is ready to be returned to service (i.e. completion of any Hot Work permits, removal of all locks, tags and other isolation equipment).
- Work team leader signs off on Permit.
- Entry supervisor signs off on Permit and Permit is filed for one year.

Trenching and Excavation

Trenching and Excavation work presents serious risks to all workers involved. A Dig Alert or One Call (811) is required prior to all excavations

The OSHA standard requires that a competent person inspect, on a daily basis, excavations and the adjacent areas for possible cave-ins, failures of protective systems and equipment, hazardous atmospheres, or other hazardous conditions. If these conditions are encountered, exposed employees must be removed from the hazardous area until the necessary safety precautions have been taken. Inspections are also required after natural (e.g., heavy rains) or man-made events such as blasting that may increase the potential for hazards.

According to the OSHA construction safety and health standards, a *trench* is referred to as a narrow excavation made below the surface of the ground in which the depth is greater than the width-the width not exceeding 15 feet. An *excavation* is any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. This can include excavations for anything from cellars to highways.

When employees are required to be in trench excavations 4-feet deep or more, adequate means of exit, such as ladders, steps, ramps or other safe means of egress, must be provided and be within 25

feet of lateral travel. Material removed from the excavation must be located a minimum of 3 feet from the edge of the excavation.

MAXIMUM ALLOWABLE SLOPES		
Soil or Rock Type	**Maximum Allowable Slopes (H:V) for Excavations <20' Deep**	
Stable Rock	**Vertical**	**90° from Horizontal**
Type "A" Soil	0.75:1.00	43°
Type "B" Soil	1.00:1.00	45°
Type "C" Soil	1.50:1.00	34°
Mixed Soil Types	1.50:1.00	34°

For more information, see the FM O&G *EH&S Management System*.

Abrasive Blasting

Abrasive Blasting applies to all operations where an abrasive is forcibly applied to a surface by pneumatic or hydraulic pressure, or by centrifugal force. Sandblasting is a type of abrasive blasting. An abrasive is a solid substance used in an abrasive blasting operation.

The hazards involved in abrasive blasting include the material that is being removed and the surface from which the material is being removed. Lead is an example of a hazardous material being removed, while exposure to silica comes from using sand and other silica-producing materials in the blasting process. Both of these materials involve inhalation hazards.

The appropriate Personal Protective Equipment (PPE) shall be utilized by all FM O&G employees and contractors in the general vicinity of the blasting operation. PPE includes, but is not limited to respiratory protection, eye protection, and hearing protection. Refer to the SDS for the blasting media for more information on specific PPE.

For more information, see the FM O&G *EH&S Management System*.

Non-Destructive Testing

Non-Destructive testing can only be preformed by qualified personnel; certified by the American Society for Non-Destructive Testing (ASNT).

A FM O&G representative must be advised of areas affected by radioactivity during a radiograph or X-Ray inspection of FM O&G equipment or welds. All FM O&G or Contract employees must utilize appropriate PPE when working in or near radioactive sources.

The radiographer shall be responsible for protecting and monitoring every person working in or near radiation sources. He must have a contingency plan, wear a pocket dosimeter and film badge at all times, establish safe boundaries and post the Radiation Caution Symbol.

For more information, see the FM O&G *EH&S Management System*.

Painting and Coating

Painting and Coating safe work practices shall be followed by all FM O&G employees and contract employees working in or near the painting and coating operation.

Personnel working near the operation shall be made aware of the operation and the affected area shall be clearly identified. Appropriate PPE must be utilized by all personnel in the work area. This includes, but is not limited to respiratory protection, eye and face protection, hand protection and hearing protection. Refer to the SDS for the coating for more information on specific PPE (See the PPE section of this *Guidebook*)

Paints and coatings may be flammable or combustible and the Flammable and Combustible liquids section of this *Guidebook* shall be consulted for these products. The respective MSDS shall also be consulted and followed while these products are being used.

When the painting and coating operation involves a confined space, the FM O&G Confined Space Entry Program shall be followed.

For more information, see the FM O&G *EH&S Management System*.

Appendix A - Well Stimulation

HIGH PRESSURE PUMPING

Required Procedures

Well stimulation or other high-pressure pumping operation must be in accordance with the detailed procedures and equipment specifications set out by management.

Before each job, thoroughly review and resolve any questions you have about the procedure.

Safety Meeting

A safety meeting, with all personnel present, must be held before the start of a job. During the safety meeting:

- A “safe area” should be designated for assembly in the event of an emergency, and
- The following items must be discussed:
- Procedures
- Hazards
- Safety precautions
- Work signals

Personnel

Ensure that only necessary personnel are on location.

Equipment on Location

All vehicles and equipment not necessary to the operation should be moved to a point at least 150 feet from the well.

If possible, locate the pumping equipment and tanks crosswind at a minimum of 150 feet from the well.

Access Roads

Access roads should be kept clear.

Discharge Lines

The discharge lines of all positive displacement pumps must have a relief valve. Relief valve discharge should be piped to a non-hazardous location and securely anchored.

If chick-san joints are used, each discharge line should:

- Have a full swing at the well and at the pump manifold, and
- Be anchored sufficiently to prevent whipping or bouncing with a properly sized whip check.

Rubber or steel-wrapped rubber hoses should not be used in discharge lines for well fracturing operations.

Hoses may be used for acidizing operations only if properly designed and rated for service, and approved by management

A check valve must be installed in each discharge line as near to the wellhead as possible.

Discharge lines must not be routed under trucks or other vehicles.

Personnel should not stand on or near pressurized discharge lines.

Testing the Discharge Lines

The discharge lines from the pump to the well must be hydrostatically pressure tested to the maximum pressure anticipated before the job begins.

Any leak that occurs must be repaired and the lines re-tested.

Connections must not be tightened while the line is pressurized.

When to Pump

Pumping operations should be conducted during daylight hours. When pumping at night is required, lighting utilizing properly classified electrical equipment must be provided to adequately illuminate the work are and all flowlines.

Pumping operations must not be conducted during electrical or severe dust storms.

Fire Fighting Equipment

Adequate fire fighting equipment must be on location, in good working condition, and strategically located.

Static Electricity

To eliminate the possibility of static electricity

build-up, all trucks and blenders should be bonded to a central point and that central point should be properly grounded.

Produced Oil

Produced oil should not be pumped into the open tanks of truck-mounted fracturing or cementing units.

Recording Pressure Gauge

Recording pressure gauges should have velocity check valve connections and should be placed in a safe area.

The hose should be securely anchored within two feet of the end connections.

Monitoring Pressure

A safety valve or monitoring device should be installed on the tubing-casing annulus to ensure that maximum pressure rating for the casing is not exceeded.

Blowout Preventer Testing

When a blowout preventer is used, it must be installed and tested according to the workover procedure approved by FM O&G management

Wellhead Requirements

If the maximum anticipated injection pressure exceeds the rated working pressure of the wellhead, the wellhead must be:

- Replaced with a blowout preventer of suitable working pressure, or
- Isolated from the injection pressure by a wellhead bypass tool. When a wellhead bypass tool is used, proper procedures for installing, inspecting, and testing the tool must be followed.

ACIDIZING

Testing Fittings and Lines

Before acidizing operations begin, wellhead fittings and injection lines must be hydrostatically tested to the appropriate test pressure. All connections must be “hobbled or “snubbed,” with properly sized whip checks.

Prevent Flowback

A check valve should be installed at or near the wellhead to prevent flowback.

Personnel Safety

When acid is being pumped, personnel should remain a safe distance from the injection lines and pumps to avoid being sprayed with acid in the event of failure.

Handling Acids

All handling of acids, including repairing acid leaks in injection lines should be done according to the specifications in the Safety Data Sheets (SDS).

Some acids may contain auxiliary reagents that are dangerous to skin and skin cuts. Personnel should review each SDS sheet accompanying the delivery.

Acidizing operations, especially acid displacement and clean-up of acidizing equipment, may generate dangerous amounts of hydrogen sulfide (H_2S). Respiratory protection must be worn when such a condition exists. At least two SCBAs must be on location.

Safety Showers and Eyewash Stations

Approved safety showers and eyewash stations must be on hand for immediate flushing.

Appendix B - Wireline, Perforating and Other Electrically Detonated Operations

WIRELINE OPERATIONS

Equipment Guidelines

All equipment used for wireline operations must:

- Meet working pressure, construction, and thread criteria and
- Be inspected, tested and maintained according to established industry guidelines or management directives.

Blowout Preventer

An approved wireline blowout preventer must be installed and tested when a wireline tool is run in a well.

Personnel Guidelines

All personnel involved in the wireline operation should be familiar with the work to be done and should be familiar with the proper valve positions while the work is in progress. Lock-Out/Tag-Out procedures may apply.

Workers must not jump to the ground from a platform or wellhead equipment except in an emergency.

Personnel other than the operator must stay away from the well, wireline, and the rear of the wireline unit except when they are needed for the operation.

Cleaning a Wireline

Personnel must not use gloved or bare hands to clean a wireline coming out of the wellbore. A mechanical or rubber device should be used to clean the wireline.

Wireline Strength

The rated tensile strength of wirelines must not be exceeded.

Working Near a Wireline

The motion of the wireline must be stopped when work is performed near the wireline.

Personnel should use great care when working near a wireline because it may become tight or slack without warning.

Personnel must not step over or walk under a working wireline.

Using Snatch Blocks or Hay Pulleys

A snatch block or hay pulley should be used for all wireline operations to relieve strain on the lubricator. The snatch block or hay pulley is attached to the wellhead equipment or other point below the bottom lubricator connection and properly secured.

Fall Protection

Climbing or standing on wellhead equipment can be hazardous. A platform, ladder, and/or fall protection should be utilized as appropriate.

Transferring Wireline

Personnel should use caution while transferring wireline or cable from one spool or reel to another. A mechanical means should be used to prevent slack.

Guiding Wireline on Drums

When wirelines are being guided on drums, an extension device three feet long or longer must be used to prevent workers from coming in contact with a line or drum. When this operation is being performed, someone must be at the drum controls.

Lubricators

During wireline operations that require a lubricator, the well valve must be closed and the pressure bled from the lubricator before it is unflanged or removed.

Repetitive Operations

During repetitive operations such as jarring, the wire should be cut periodically to prevent fatigue and subsequent failure around the hay pulley, sheaves, and other areas.

Marking the Area

Safety flags or the equivalent should be placed between the unit and the well while wireline operations are in progress. Appropriate signs should also be posted.

Rigging

Long lubricators should be rigged up using hoisting equipment. Guy lines should be attached to the lubricator when:

- Working in high winds, or
- Using lubricators longer than 20 feet, or
- Working with extremely high pressure.

PERFORATING

Required Procedures

Perforating operations must be in compliance with workover operations.

Authorized Personnel

Only authorized personnel may handle gun perforating equipment.

Only personnel required to rig up or rig down the lubricator and perforating gun should be allowed in the vicinity of the wellbore.

Personnel must stand clear of the lubricator when pressure testing with perforating tools in the lubricator.

Equipment Location

On land locations, the perforating truck must be parked so that the truck or perforating cable is not near or under power lines.

Perforating Gun Precautions

When a perforating gun is fished out of the hole after being lost in the well, a representative of the respective service company must be present at the wellsite to ensure that the gun is handled and defused safely.

When a perforating gun is being loaded or run, temporary signs that prohibit the operation of signal transmitting equipment must be placed in the vicinity of the operations including any roads that enter the location.

Operations involving perforating guns at the surface must not be conducted during electrical storms.

Signal Transmitting Equipment

Radio, radar, cellular telephones, and other signal transmitting equipment must be turned off within 500 feet of:

- Perforating operations
- Electrically fired back-off operations and
- Electric blasting caps unless the caps are stored in grounded metal containers.

NOTE: Microwave equipment may remain

operative during the entire perforating operation if the antenna is not focused toward the operations.

Breaking Radio Silence

Radio silence can be broken if the gun is in the well and is 200 feet or deeper from ground level. In case of emergency, the FM O&G supervisor can break radio silence.

If an armed gun is on the surface and radio silence must be broken, the service company's supervisor should be contacted to shield the detonator or remove it and place it in a suitable safe container before radio silence is broken.

Avoid Accidental Detonation

The perforating unit/equipment, the wellhead equipment, and the derrick/rig equipment must be at the same electrical potential to avoid an accidental detonation. An electrical connection must be made between each of the three components and the potential difference determined between them.

Operations must be shut down if there is a difference in voltage greater than 0.25 volts between any two components.

Perforation Equipment Guidelines

Workover operations must be followed when performing electric and slick line operations.

The rotary should be locked during perforating operations.

All welding machines in the vicinity of perforating operations must be shut down.

At a minimum, the following equipment should be utilized in all perforating operations:

- Wireline blowout preventer
- Lubricator
- Stuffing box
- Control head

NOTE: The lubricator should be long enough to contain the entire tool assembly.

A pump-in tee should be installed for killing a well if the lubricator is rigged up on tubing or drill pipe.

Grease injectors must be used on all wells with greater than 2000 psi shut-in pressure.

Lubricator Packoff and Hand Pump Testing

Before perforating equipment is lowered below the blowout preventers, the lubricator packoffs and hand pumps must be tested using appropriate procedures according to workover operations.

Under-Balanced Perforating Operations.

Under-balanced perforating operations should only be conducted during daylight hours.

Monitoring

The wellbore pressure and/or fluid level should be monitored to ensure proper well control throughout the perforating operation.

Post-Perforating Inspection

Before leaving the location, the service company's supervisor must ensure and document on the job ticket that no explosives remain on location.

Appendix C - Well Testing

Before Starting Flow Test

Well testing must address unexpected pressure releases (UPR) procedures prior to initiation of testing.

Surface flow should be initiated only in daylight hours.

Before the control-head valve is opened, a suitable flowline should be:

- Laid from the derrick floor to the surface test equipment, and
- Connected to the control head.

NOTE: This line must be properly anchored. Hose connections to the control head must be securely fastened to the elevator bails. Hoses are to have properly sized whip-checks installed. Hard lines are to be properly anchored.

During Testing

Monitor the area around the rig floor and test separator for the presence of hydrogen sulfide (H_2S) and combustible gas. All unauthorized personnel are to stay clear of the test equipment and flow lines.

Completing the Test

In order to prevent unexpected pressure releases, *before* pulling the drill string:

- The drill string should be filled with fluid, and always be reversed or circulated free of hydrocarbons.
- If unable to circulate, consider other options, such as, perforating the drill pipe before tripping.

NOTE: Field Supervisor approval is required to pull the drill string without circulating. This operation must be done during daylight hours.

Restrictions

Open fires and welding are not permitted during well tests, except with an approved Hot Work Permit

Line Requirements

A flare or test line from a well to the atmosphere should be:

- As free of elbows, tees, and bends as possible, and
- At least 150 feet long and anchored securely.

NOTE: Targeted tees should be used at turns instead of elbows.

Where 90° turns or choke tees exist, the line should be secured with stakes driven through holes in a steel template.

The line should be held with chains and boomers as needed to counteract the reverse thrust caused by freeing or plugging of the line and the sudden release of pressure.

Gaseous Fluid Stream

A gaseous fluid stream should not be produced directly into a test tank or frac tank; utilize an appropriately rated liquid/gas separator.

Free liquid is to flow into a tank or production system. Free gas is to flow to a flare or back into the production system.

Facility Requirements

All temporary or portable testing facilities must include bleeders and flare/vent lines.

Orifice Plate

When removing an orifice plate, keep clear of the orifice fitting opening.

Test Tanks

Test tanks should have fixed ladders and a landing platform or spiral staircase.