Student Information Sheet

Module 1

Module 2

Module 3

Module 4

Offshore Module

Safety and Environmental Management System (SEMS) Module

Terrorism Response Awareness Program (TRAP) Module

Student name: __________________________________________

Company: ______________________________________________

Date: _______________

You may write or mark in this workbook. All tests will be taken on a Student Information Test Answer Sheet (SITAS). All of your test answers should be marked on that answer sheet only. Fill out all information on the answer sheet, print clearly and sign as indicated. Your permanent PEC photo ID card will be delayed if all necessary information is not completed on your SITAS.
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# PEC Basic Orientation Student Workbook

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Acronyms

Glossary
Learning Safe Behaviors
Safety is perceived as removing safety hazards, unsafe conditions, or unsafe acts. However, true awareness goes beyond monitoring only the things accepted as a safety hazard.

Situation of Accident Potential
A situation of accident potential (SOAP) requires planning ahead before starting the job or process so that the potential for an accident is removed. It is being ready if a problem occurs and able to respond in a safe and controlled manner.

A _______________ of ________________ ________________ (SOAP) requires planning ahead before starting the job or process so that the potential for an accident is removed.

A SOAP hunt is a careful process of recognizing potential hazards or safety problems and fixing them before you start a job. Get into the habit of observing SOAPS when you get to the jobsite. This requires that you become proactive (removing or fixing a potential safety problem before it leads to an accident) instead of reactive (waiting until after an incident has already happened).

A slippery spot on the ground, a nail sticking up from a board, or a broken rung step on a ladder would all be safety hazards. SOAP introduces the concept of removing or correcting those situations that have the potential to be a safety hazard or to become a hazard under certain conditions.

Safety is not an option. Learn to live and work safely.

Good Behavior
You will be expected to dress appropriately and practice good personal hygiene. This includes off-duty hours if you are staying overnight at a company location. These must be removed while at the jobsite. This is for your safety. Loose clothing and jewelry have been responsible for many accidents in the workplace.

Rules and restrictions are there for a reason. You are expected to obey all company and operator policies. Do not run. Always use the handrails when ascending or descending stairs.

When not in use, place tools, lifesaving, and firefighting equipment, etc. in proper storage areas. When in use keep tools and equipment in good condition (guards in place, no damaged cords or other parts, no unapproved modifications, etc.) It is not okay to use a tool or equipment with a broken safety or guard. Only approved and qualified persons can repair and modify tools and equipment. Defective equipment must be tagged and removed from service.

Intervention and Stop Work
Three A’s of Safety
Three things are necessary to ensure that a safety program works effectively:
- Atmosphere – a working environment that ensures safety is a priority
- Attitude – a positive perspective towards safety
- Action – the willingness to stop unsafe acts or correct unsafe conditions

Intervention
Intervention is the action to change, slow down or stop an unsafe act or condition. It should be authorized by company management and goes beyond a safety observation. Intervention requires direct personal action.

Stop Work
Stop work is the authority and obligation to suspend work when health, safety and environmental (HSE) risks are not understood or have not been clearly established. It is actually a process to resolve unsafe conditions, acts, errors, omissions, or lack of understanding whether these things are real or perceived.
Every worker knows that it is mandatory that they immediately stop unsafe work. If you see an unsafe or potentially unsafe act or condition, you must stop the job without fear of reprimand or reprisal by coworkers or management.

Suggested stop work authority process:
- Identify the need
- Notify supervision
- Positive effort
- Affected personnel
- Agreement
- Determine the correct action
- Resolution
- Feedback
- Documentation

Every worker knows that it is __________________________ that they immediately stop unsafe work.

Stop Work Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify the need</td>
<td>- Made from observation</td>
</tr>
<tr>
<td></td>
<td>- Could be a feeling</td>
</tr>
<tr>
<td>Notify supervision</td>
<td>- Discuss what to do if people do not stop work</td>
</tr>
<tr>
<td>Positive effort</td>
<td>- Should not be considered a negative act</td>
</tr>
<tr>
<td></td>
<td>- Everyone should cooperate</td>
</tr>
<tr>
<td>Affected personnel</td>
<td>- Remove workers from area</td>
</tr>
<tr>
<td></td>
<td>- Stabilize the situation</td>
</tr>
<tr>
<td></td>
<td>- Make area as safe as possible</td>
</tr>
<tr>
<td>Agreement</td>
<td>- Intervention</td>
</tr>
<tr>
<td></td>
<td>- Corrective actions</td>
</tr>
<tr>
<td>Determine the correct action</td>
<td>- Job is safe</td>
</tr>
<tr>
<td></td>
<td>- Job is unsafe</td>
</tr>
<tr>
<td>Resolution</td>
<td>- Validates need for stop work</td>
</tr>
<tr>
<td></td>
<td>- Work suspended</td>
</tr>
<tr>
<td></td>
<td>- Document differences of opinion</td>
</tr>
<tr>
<td>Feedback</td>
<td>- As soon as possible to all personnel</td>
</tr>
<tr>
<td></td>
<td>- No penalty for stop work</td>
</tr>
<tr>
<td>Documentation</td>
<td>- Intervention</td>
</tr>
<tr>
<td></td>
<td>- Feedback</td>
</tr>
</tbody>
</table>

Responsibilities
- Worker – obligated to intervene or stop work when they feel it is necessary. Additionally, they should support others when they try to intervene.
- Supervisor – should allow stop work authority without retribution and recognize proactive participation.
- Manager – should set clear expectations, resolve conflicts and establish accountability for stop work policies.

When to Intervene
The following lists examples of when intervention should occur:
- Carrying materials while climbing a ladder
- Not wearing proper PPE
- Not using handrails when using stairs
- Improper fall protection
- Working without a permit
- Improper lifting techniques
Intervention and Building a Safety Oriented Team
Safety lies in standardized procedures, careful training, combined with assurance of accountability. With these principles in place, company safety records will reflect the fact that all members of the team are working together effectively. A safety oriented team has standardized procedures, careful training, and the assurance of accountability.

Building a Behavior Based Safety Program
Four parts of a typical behavior based safety (BBS) program:
- Written program
- Observation process
- Observation reporting process
- Safety meetings

| Observation process | - Observe to understand  
|                     | - Communicate issue  
|                     | - Identify alternate behavior  
|                     | - Clarify commitment to do what is safe  
|                     | - Obtain agreement to change unsafe behaviors  
|                     | - Observe to follow up  
| Observation reporting process | - Cards or other documentation  
| Safety meetings | - Tailgates  
|                  | - Formal meetings  
|                  | - All are means of feedback  

Making an Observation
Companies have procedures that determine how individual programs are used and most have an observation process similar to the following:
- Go to the action
- Look at people as much as possible
- Introduce yourself
- Make a situation-centered observation
- Make a data-centered observation
  - Check all behaviors on the data sheet
  - Log safe and unsafe behaviors
- Give verbal feedback
- Submit data sheet for processing

Roles and Responsibilities
BBS programs are affected by supervisors, managers and employees. A steering committee may oversee the program.

BBS programs are affected by supervisors, managers and _______________________.

Roles and Responsibilities
- Supervisor - Should keep all personal observation data confidential. Ensure that no punitive actions are taken due to the observation. Provide time for employees to perform observations and document them. Most BBS programs have a system to collect the data. Understand what the data is saying about safety performance and remove any barriers to safe behavior that may exist. Make BBS a part of daily operations.
- Manager - Provide oversight for supervisors. Understand the BBS process to eliminate organizational issues that could stand in the way of supervisors.
- Employee - Develop a positive safety attitude. Take BBS training to fully participate in the process. Participate in safety meetings and support the BBS process.
- Steering committee - Develop action plans based on the observations. Communicate safety issues at safety meetings. Make safety recommendations to management. Provide BBS training to ensure all employees are using the program consistently.
PEC Observation Card

Date: _____________________________
Observer: _________________________
Location: __________________________
  ○ Onshore
  ○ Offshore
Activity Observed: __________________

Personnel Observed: ○ Company ○ Contractor
  Personal Protective Equipment

  S  AR
  ○ ○ Head  ○ ○ Clothing
  ○ ○ Eyes  ○ ○ Hardhat
  ○ ○ Face  ○ ○ Feet
  ○ ○ Ears  ○ ○ PFD
  ○ ○ Hands  ○ ○ Respirator
  ○ ○ Other

  Slips, Trips & Falls

  S  AR
  ○ ○ Housekeeping  ○ ○ Hoses/Leadlines
  ○ ○ Barricades/Handrails  ○ ○ Stairs/Steps
  ○ ○ Ladders  ○ ○ Scaffolding
  ○ ○ Walkways  ○ ○ Fall Protection
  ○ ○ Other

  Materials Handling

  S  AR
  ○ ○ Manual Lifting  ○ ○ Taglines
  ○ ○ Body Position  ○ ○ Signals
  ○ ○ Mechanical Lifting  ○ ○ Slings
  ○ ○ Other

  Tools

  S  AR
  ○ ○ Proper Tool  ○ ○ Guards/Safetys
  ○ ○ Proper Condition  ○ ○ Pinch Points
  ○ ○ Proper Use  ○ ○ Hot Spots
  ○ ○ Other

  Procedures

  S  AR
  ○ ○ Welding/Cutting  ○ ○ Swing Rope
  ○ ○ Grinding  ○ ○ Confined Space
  ○ ○ LOTO  ○ ○ Equipment Opening
  ○ ○ Painting/Blasting  ○ ○ Elevated Work
  ○ ○ Other

Was Feedback Given? ○ Yes ○ No

Feedback Comments:
__________________________________________
__________________________________________
__________________________________________
__________________________________________

S = Satisfactory  AR = Action Required

Near-Miss Report:
  ○ Personal Injury  ○ Property Damage
  ○ Vehicle Damage  ○ Spill or release
  ○ Other ________________

At Risk Behavior:
__________________________________________
__________________________________________
__________________________________________

Description of Incident:
Time of Day: __________________________ am/pm
Day of Week: Mon Tue Wed Thu Fri Sat Sun
Approx Temperature: __________________ F/C
Visibility: Outside:
  1) Dawn Day Dusk Night
  2) Clear Rain Fog Cloudy T-Storm
Inside: Well Lighted Other ________________

Root Cause:
__________________________________________
__________________________________________
__________________________________________

Corrective Action:
__________________________________________
__________________________________________
__________________________________________

Supervisor’s Review:
__________________________________________
__________________________________________
__________________________________________

Near-Miss Classification:
__________________________________________

Risk Assessment:
  ○ Low Risk
  ○ Medium Risk
  ○ High Risk

MEDIUM TO HIGH RISK
PERFORM WORK GROUP INVESTIGATION
Alcohol, Drug and Weapon Policies

Drug-free Workplace Policy

The drug-free workplace policy was developed to protect the health and safety of all employees, customers and the public, and may include policies concerning contraband, which includes the possession, use, sale, transportation or promotion of alcohol, legal and illegal drugs, firearms or weapons, explosives, other controlled substances and related paraphernalia, as well as the possession of stolen property.

Required testing categories:
- Pre-employment
- Post accident
- Random
- Reasonable suspicion
- Return to duty
- Follow-up

Be sure you are familiar with your company’s policy, which may include rules on:
- Testing
- Searches
- Seizures
- Violations
- Employee assistance program

Testing
- Results kept in personal medical and exposure records
- Records protected by HIPAA

Searches
- Discuss what can be searched
- No person is exempted

Seizures
- Confiscation of contraband

Violations
- Termination of employment
- Legal prosecution

Employee assistance program
- Provide confidential problem identification and assessment
- Consult, train, educate and assist

Government Regulations

The Department of Transportation (DOT) regulates pipelines and commercial carriers in commerce. Pipelines are covered under 49 CFR 199 and motor carriers are under 49 CFR 382. These regulations state the safety sensitive functions for each and if testing is refused, the safety sensitive functions cannot be performed.

| Government Regulations | 49 CFR 199 – Pipeline | Applicable to pipeline operators only with employees  
Located in territory of the United States  
Includes the Outer Continental Shelf (OCS)  
Does not apply if laws of another country are violated  
Does not apply to covered master meter systems  
Pipelines with petroleum gas or gas/air mixtures  
Safety sensitive functions: Operations, maintenance, emergency response duties |
| --- | --- | --- |
| | 49 CFR 382 – Motor carrier | Applicable to operators and employers  
Applies to operation of commercial motor vehicles subject  
Commercial driver’s license (CDL)  
The Licencia Federal de Conductor (Mexico)  
Canadian national safety code, commercial driver’s license  
Safety sensitive functions: Waiting to be dispatched unless relieved by employer, any work on commercial vehicles, driving or operating a commercial vehicle, being in or on a commercial vehicle except berthing, loading or unloading, any time spent with disabled vehicle |
Supervisory Training
Supervisors can use physical, behavioral, speech and performance indicators to recognize substance abuse. They must receive training on alcohol and controlled substance abuse. Required supervisory training includes 60 minutes on alcohol misuse and 60 minutes on controlled substance abuse. Supervisors are trained to use reasonable suspicion to recognize changes in behavior that may indicate substance abuse.

Privacy Rights and Access to Medical, Testing and Exposure Records
There is no room in our industry for even the occasional recreational drug user. In addition, inappropriate use of alcohol will not be tolerated. Test results, including drug tests, are kept in your employee medical and exposure files and are protected by your privacy and access rights. It is necessary for your employer to maintain these records on you.

Employee Awareness
Be aware that refusal to cooperate in a search, or a violation concerning any of the above substances, will result in your not being allowed onto the operator premises, and possibly termination of employment and even legal prosecution.

If you are taking medications that affect work performance, inform your supervisor. Medication, whether prescription or over-the-counter, must be in the original container with the labels intact. Never offer your prescription medication to another individual and never take anyone else’s medication.

Fit to Work
All employees must be fit to work. This means they are rested and have reported the effects of any legal prescriptions they are taking to their supervisor. An employee must also demonstrate they are fit to return to work. They may be required to undergo an evaluation prior to resuming their duties.

Contraband
Some items, called contraband, are not permitted on the jobsite. Ensure you know what is considered contraband and the policies for each jobsite. Contraband may include:
- Illegal drugs
- Alcohol
- Lighters and matches
- Explosives
- Weapons
- Ammunition
- Clubs or batons

Areas of Concern
There are four areas of concern in the workplace regarding alcohol and substance abuse.
- Quality of life – if an individual has an abuse problem, their quality of life is greatly degraded. This condition can affect an individual’s attitude and relationships with coworkers.
- Accident prevention – a person with an abuse problem should be considered a hazard to their coworkers because they have a higher probability of being involved in an incident.
- Regulatory compliance – policies around abuse exist because companies do not want unsafe acts and conditions to occur. They also exist to be in compliance with the regulations. If a company violates the regulations, they could be fined, or ultimately, shutdown.
- Quality of work – a person with a problem is usually distracted and unable to produce the same quality of work as a person without a problem. Quality of work ensures safe operation and therefore leaves no place for abuse in the workplace.
Workplace Violence
Workplace violence is any action toward an employee that threatens or impacts their physical or mental well-being or an act that causes damage to company property. This definition includes stalking and sexual harassment. Companies may have a written workplace violence prevention (WVP) program.

Applicable Standards
For many industries, workplace violence represents a serious occupational risk. The general duty clause requires companies to provide a safe and healthful working environment for all workers. If there is a recognized violence hazard in the workplace and companies do not take feasible steps to prevent or abate it, companies can be cited under the general duty clause.

Categories of Violence
Four categories of workplace violence:
- Personal relationships
- Strangers
- Client/customers
- Coworkers

Recognizing Violence
Be alert to conditions that might result in violence. To recognize violence in the workplace, be aware of people who have a history of violence, changes in mood, personal hardships, mental health issues or have made verbal threats of violence. Getting to know your coworkers will allow you to know if something is wrong.

Notification
Alert your supervisor as soon as there is any sign of violent or suspicious behavior. Do not escalate the frustration level by allowing yourself to be drawn into a violent episode. As in any safety related situation, coworkers should work together to avoid having any one of them become the target of violence. Work to calm the situation and separate coworkers if you can without harm to yourself. You are part of a team, so respect your coworkers. Do not violate company policies.

Workplace Violence Prevention
Having a productive and safe working group requires that we all meet certain standards of personal conduct and behavior. Management, supervisors, and employees must work together to stop workplace violence. Commitment and involvement are essential in any safety and health program.
- Teamwork
- Respect for coworkers
- No horseplay
- Legal prosecution
- Zero tolerance
Zero Tolerance
Harassment, including sexual harassment, consists of unwelcome sexual advances, requests for sexual favors, threats, actual bodily contact, and other verbal or physical conduct that interferes with an individual’s ability to work without fear of attack or reprisal. Actions or remarks that create an offensive or hostile working environmental are not acceptable and will not be tolerated. Disregarding this rule is grounds for immediate firing and possible legal prosecution.

Zero tolerance means that no form of violence or harassment will be tolerated. This includes ethnic, racial, or religious remarks, sexual harassment, offensive jokes, graffiti, profanity, offensive material, excessive noise or other distractions. Never allow, or participate in horseplay, violence, harassment or practical jokes. Not only are they distracting, but they also may lead to accidents and injury, and even death. A simple joke may appear to be a suspicious behavior or result in a reprimand by others not in on the situation.

means that no form of violence or harassment will be tolerated.

Communication
Poor communication is a contributing factor in many accidents. Workers are often injured because safe work practices have not been effectively communicated. Employees with good communication skills communicate openly and respectfully. They also provide better feedback by using a questioning technique.

communication is a contributing factor in many accidents.

When working with operator personnel, it is easy to discuss job related activities directly with the operator employees. In some situations, that is an acceptable practice. However, in most cases it is important for the contract employee to communicate through the contractor supervisor.

Simultaneous Operations
Simultaneous operations (SIMOPS) is having multiple jobs of any kind at one jobsite. During SIMOPS, good communication is critical to safety because the overall risk is higher.
Incident Reporting and Investigation
An incident is an unplanned event that could have, or did, cause occupational illness, personal injury or property damage. All incidents have consequences or outcomes and are due to unexpected reactions from people, equipment, materials, or the environment.

A near miss is a special type of incident which did not result in the consequences as stated above. Examples of near misses include having a tool fall from a scaffold almost striking a worker or working on a pump and not installing a blind.

First aid refers to medical attention that is given immediately after an injury occurs and is usually provided at the scene. Most of the time, first aid is a one time, short term treatment that requires little training or technology to perform. Examples for first aid include placing a band aid on a finger or removing something from the surface of the eye.

Although all incidents should be taken seriously, some of them result in an OSHA recordable event. These are work related injuries or illnesses that result in death, days away from work, restrictions to work, transfer to another job, medical treatment beyond first aid, loss of consciousness, or significant injury or illness diagnosed by a doctor or licensed health care professional.

Categories of Incidents
Incidents will fall into one of the following four categories:
- Lost time incident
- No lost time incident
- Near miss incident
- Motor vehicle incident

Reporting Responsibilities
You will not get in trouble if you report an accident or incident. Immediately report all incidents to a supervisor, no matter how minor they may appear. Use the site specific emergency procedures. Ensure the injured worker has received care to your level of training. Preserve the accident site for an accident investigation. The primary goal of reporting and investigations is to prevent future accidents.

Report the following:
- Injury/first aid case
- Property damage
- Vehicle damage
- Substance/chemical release
- Near miss
- Suspicious behavior, objects, or people

Any work being performed under unsafe conditions should be halted. Report all HSE incidents immediately. It is your responsibility to ensure that all incidents are reported. Not reporting incidents may result in disciplinary action and can be grounds for firing.

Incident Investigation
The purpose of accident investigation is to identify the cause or causes of an incident. One of the first tasks in the investigation is to establish a sequence of events, or timeline, leading to the incident. The sequence of events allows analysis of the relationship between things and people involved in the event. The investigation should be a fact-finding and not a fault-finding mission to create a learning experience that will allow improvements in safety.

We investigate incidents to develop a root cause and provide feedback to the company so that everyone learns from the mistake. If the event is a learning experience, then the lesson will prevent similar future events. Reporting and investigating is not to place blame, but to find understanding.

The purpose of accident investigation is to identify the cause or causes of an _________________.

The purpose of accident investigation is to identify the cause or causes of an ______________________.
**Short Service Employee**

New employees or employees new to a position for less than six months are considered to be a short service employee (SSE). Stickers can be placed on the hard hats of SSEs or their hard hats can be a contrasting color to those of other workers, marking them as being new to the task. Coworkers are immediately made aware that this person may need help or instruction to perform a routine task.

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**Mentoring**

Mentoring is placing an SSE with an experienced employee until the SSE has become properly trained and experienced. This is a good way to assist the SSE during the training period. The mentor should be aware of the SSEs experience levels and be able to provide close supervision and instruction. The mentor will not allow the SSE to perform any task in which they have not been properly trained.

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**Safe Driving Practices**

Motor vehicle crashes are the leading cause of death among those ages 5-34 in the US. More than 2.3 million adult drivers and passengers were treated in emergency departments as the result of being injured in motor vehicle crashes in 2009. The lifetime costs of crash-related deaths and injuries among drivers and passengers were $70 billion in 2005.

**Driving Distractions**

Never use a cell phone while operating a motor vehicle. It is usually policy while operating any company owned vehicle or while driving on company or host properties. The distraction caused by driving while using a cell phone can be compared to a 0.8% blood alcohol concentration. Distractions can be caused by other things including conversation with passengers, eating, or adjusting equipment, such as radios and air conditioning.

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In addition to keeping your company vehicle in good mechanical condition, you should obey all traffic laws, drive defensively, use your seat belt, never drive under the influence of alcohol or drugs, and get enough sleep before your trip. All of these are part of defensive driving which goes beyond just the mechanics of driving. You must watch for actions of other drivers and not allow yourself to become impatient or aggressive.

**Licenses and Certifications**

To drive a commercial vehicle, you must have a commercial driver’s license (CDL). You must have your license with you when you drive and a person is allowed only one driving license by law. CDLs have three classes, A, B and C. The classes are determined by the weight capacity of the vehicle, whether passengers are carried and if the vehicle is placarded for hazardous materials. CDLs can also have operational endorsements and restrictions based on the type of vehicle and qualifications of the driver.

**Road Conditions**

Weather conditions can create road and driving hazards. Rain brings oil to the surface making it slick. In cold weather, ice can be on the road and be completely invisible which is called black ice. Reduce your speed if necessary to adjust to the conditions and hazards of the roadway.

Another roadway issue is presented by wildlife. Always be alert for wildlife crossing signs and scan the edges of the road for wildlife. Never assume that wildlife will get out of your way. Remember that when one animal crosses the road, others may follow. Reduce speed after dark and lower the intensity of your dashboard lights. This will aid you in spotting the eyes of animals beside the road. Do not throw food or litter from your car. Food lures animals close to the road where they become more of a driving hazard.
Vehicle Inspection
Commercial vehicles must be inspected before driving. The inspection includes the engine compartment, in-cab checks, outside of the vehicle and an air brake test if the vehicle is equipped. Never park in restricted zones or where you block access to roads, fire lanes, firefighting equipment, etc. Your vehicles, luggage and toolboxes must all be available for search. Refusal to cooperate with a search is grounds for dismissal and the vehicle or persons involved may not be allowed onto company property.

Journey Management
Journey management is a process to reduce risk while driving. It limits the number of driving hours per day and provides safety through accountability. Drivers must check-in while travelling, plan their routes and be drug and alcohol free. Journey management also manages fatigue by requiring rest periods and taking consideration of road and weather conditions.

Backing, Parking and Location Hazards
When backing, recognize your blind spots. Walk around your vehicle to determine clearances and locate any obstacles. When parking, never block fire or emergency lanes. Park in designated areas and know the rules regarding back-in parking. Additionally, ensure your vehicle is in the center of the parking space. When parking, be aware of site specific hazards, such as children or pedestrians, as well as facility equipment. Other hazards that can be present include parking lot marker posts, multiple vehicles, soft or muddy spots, potholes, tire hazards, such as stray materials with sharp edges, nails, or protruding screws.

Loading, Securement and Off-loading
Loading and securement are covered by the Federal Motor Carrier Safety Administration (FMCSA) and state laws. Many roads and bridges have weight limits. Loads should be permissible for the route. Securement ensures loads do not shift or fall from the vehicle. There are laws to govern how different types of loads must be secured. To load or unload a vehicle, ensure the brakes are set and chocks are on the wheels. Protect gaps and drop-offs at docks. Use dock levelers where needed. If using a forklift, ensure the flooring can support the forklift and load combination.

Seat Belts
The top five things to know about buckling up:

1. Wearing a seat belt is the single most effective thing you can do to protect yourself in a crash. During a crash, being buckled up helps keep you safe and secure inside your vehicle.
2. By not wearing your seat belt, you could be thrown into the air bag at a force that could injure or kill you. It is important to remember that air bags are designed to work with seat belts, not replace them.
3. While wearing your seat belt is important, it is also important to wear it properly. Place the shoulder belt across the middle of your chest and away from your neck. Adjust the lap belt across your hips and below your stomach. Never put the shoulder belt behind your back or under your arm.
4. Remember that the fit of the seat belt matters. Before you buy a vehicle, ensure the seat belts are a good fit for you. If you need a roomier seat belt, ask your dealer about seat belt adjusters or extenders.
5. Occupant protection is for everyone.

Wearing a ________________________ is the single most effective thing you can do to protect yourself in a crash.

Driving Under the Influence
Driving under the influence (DUI) includes intoxication from alcohol or other drugs. It is considered a criminal offense. Never arrive at work under the influence of any substance that may impair your ability to make good decisions.

Never arrive at work under the ________________________ of any substance that may impair your ability to make good decisions.

Contraband
Never carry contraband in a vehicle. It may be grounds for dismissal or keep you from entering company property. Most companies reserve the right to randomly search your vehicle, luggage and toolboxes. Refusal to cooperate in a search can be grounds for dismissal or lead to criminal prosecution.
Personal Protective Equipment

Hierarchy of Controls
You must know about the hierarchy of control for dealing with hazards.

- Elimination completely removes the hazard.
- Substitution replaces a toxic substance or hazardous work practice with a less hazardous one.
- Engineering controls include mechanical barriers, guarding, ventilation or insulation to isolate the hazard.
- Administrative controls use policies, procedures, training and measures to minimize exposure to the hazard.
- Personal protective equipment (PPE) is a last effort to protect from exposure to hazards.

Selection, Fit and Adjustment
Ways to determine the appropriate PPE necessary for your job include:

- Pre-job planning
- Site specific orientation
- Supervisor
- SDS
- Container labels

PPE must meet ANSI requirements. You should always inspect and check PPE for proper fit, construction, and operation. You should know how to don it and use it correctly. Additionally, you should know how to care for PPE and be aware of its limitations. Do not give in to the temptation to work a job without necessary PPE because it would be quicker just to do the job than to don the PPE and then work the job. You should still wear the necessary PPE even if it takes a little more time.

Responsibilities
It is the responsibility of your employer to specify the appropriate PPE. It is their responsibility to train you in its proper usage, but it is your responsibility to make sure which PPE is required and that you inspect and wear it properly.
Head Protection

Hard Hats
Hard hats are designed to give your head maximum protection. Any changes or modifications may reduce its ability to withstand stress or change its shock-absorbing capabilities. Your hard hat must be ANSI approved. Most companies require a Type E hard hat. When cleaning, use only a mild soap and water. Some chemicals will damage the hard hat and decrease its shock-absorbing ability. Also, check the suspension. Make sure that it is intact and allows adequate space between the cradle and the inside top of the hat. Replace the cradle or complete hat if worn or damaged. Do not modify. Do not drill holes in your hard hat. Do not paint your hard hat. Do not store items in or on your hard hat.

Inspection
You should frequently inspect your hard hat to ensure it is not damaged. You should make the following checks:
- Look for an ANSI label or etching
- Check for cracks, dents and chips
- Check the suspension for damage
- Check the manufacturing date
- Compress the hard hat and check for brittle plastic

You should inspect your hard hat frequently to ensure that it is not _________________.

Face and Eye Protection

Safety Glasses
Use only ANSI approved eye protection. Look for the ANSI Z87 seal of approval on the frame and a manufacturer code on each lens. If you wear prescription glasses, special frames and lenses must be used. All safety eyewear must have approved side shields designed for the frame being used. Slip-on plastic side shields do not provide adequate protection and are not ANSI approved. If you are in an area where a hard hat is required, you should also wear your safety glasses. Keep your glasses clean. Routinely inspect your safety glasses for scratches or nicks that might impair your vision.

Safety Goggles
Goggles may be worn by themselves or under a face shield. Goggles fall into two categories, impact and chemical. Impact goggles protect against dust and particles and usually have ventilation holes. Chemical goggles protect against liquid splashes and have indirect vents. Ventilation is necessary to prevent fogging.

When removing goggles be aware of any dust or particles that may be resting on top of them that could fall into your eyes. As with safety glasses, keep goggles clean.
Face Shields
Face shields are designed to protect the face from flying debris and splashing chemicals. Always use them with the appropriate form of eye protection. When wearing a face shield, safety glasses or goggles must also be worn.

When wearing a face shield, __________________________ or __________________________ must also be worn.

Contact Lenses
Be sure to know the rules of your company and host operator. Some do not allow workers to wear contact lenses.

Remember what your hands have touched. Rubbing your face to remove sweat or dust can inadvertently place chemicals or particles in the eye causing severe eye injuries.

Welding Operations
Welding operations require the use of equipment specifically designed for that purpose:
- Arc welding requires an ANSI approved welding hood with the appropriate tinted, filter glass in place.
- Gas cutting or brazing requires ANSI approved tinted goggles or other suitable eye protection.
- Helpers and attendants must wear ANSI approved goggles, even if not directly engaged in cutting or welding.

Hearing Protection
Hearing Loss
Hearing loss is a gradual, and most of the time, an unrecognized process. In most cases, the hearing loss caused by repeated, long-term exposure to excessive noise is irreversible. Wearing the appropriate hearing protection can prevent loss of hearing. Be alert for posted signs requiring hearing protection in the area.

You will also know when to wear hearing protection from pre-job meetings, site specific orientations, warning signs and placards, and by using your own judgment. You probably need hearing protection when you experience ear discomfort or when you cannot understand spoken conversation from a distance of two feet or less.

You probably need hearing protection when you experience ear discomfort or when you cannot understand spoken conversation from a distance of __________________________ or less.
Noise Reduction Rating
Noise reduction rating (NRR) is a number rating system for hearing protection that is measured in decibels (dB) and it informs you of how well hearing protectors reduce sound. The NRR can be found on the hearing protector package. After determining the required NRR, select the type of protection that fits well and is comfortable.

Types of Hearing Protection
Hearing protection is available in several different forms and you should wear a style that is comfortable and still provides adequate protection. Earplugs may be made of foam or plastic. Foam earplugs are disposable and should not be reused. Plastic earplugs can be reused as long as they are cleaned. Plastic earplugs can be ribbed or custom molded. Earplugs provide can provide a NRR of about 33 dB.

Earplugs must be properly worn to be effective. The earplug must be fully and correctly inserted into the ear canal. To check proper fit of earplugs, cup your hands over your ears. If there is a change in the noise you hear, then reinstall the earplug.

Earmuffs protect the outer as well as the inner ear. Normally the NRR of earmuffs is less than earplugs and can be reduced even more if the earmuff is not properly sealed around the ear. Earmuffs are also used to provide double hearing protection for noise exposures greater than 100 dB over 8 hours.

Foot Protection
Safety Shoes
Select the type of safety shoe required by your company and the type of work you will be doing. Your shoes should be ANSI or ASTM approved. Keep your shoes in good condition. Replace them if the leather is worn to the steel toe or if the sole is worn past the traction ribs. A well-defined heel will increase your safety when climbing ladders. A rubber boot may be needed if you are working in water, excessive oil, or chemicals. Many operators prefer a non-conductive, non-skid, steel toe boot. You should also select a shoe that is comfortable. It is important to select the type of safety shoe that fits the type of work you will be doing.

Select the type of safety shoe that fits the type of ____________________________ you will be doing.

Hand and Arm Protection
Many things can lead to hand injuries such as wearing the wrong PPE, faulty equipment, broken tools and guards or guards out of place. Even human error due to boredom, inattentiveness or distractions can lead to hand injuries. Often minor injuries are a signal that you are not paying close enough attention to your work.

Hand Safety
It is generally accepted that about one-third of all oil and gas industry accidents are hand injuries. Do not forget to watch both hands. Beware of pinch points and other hand hazards, such as crushed fingers or hands in door jams. When pulling a load through a doorway or tight area, losing control of a lifted load can cause loads to shift or drop and create hand hazards. Use proper PPE and work in the right way.

It is generally accepted that about one-third of all oil and gas industry accidents are ____________ injuries.

Do not use your hands as tools. Ensure your body is in the correct position so that your hands are not placed in jeopardy. If operating saws, use a push stick and not your hand to complete a cut. Be alert for pinch points where your hands may be injured. Always wear gloves when working with hot machinery, knives, and hand tools unless otherwise advised not to. Secure your work and use LOTO where applicable.
How To Wear Soft Foam Earplugs

To get the best protection from your soft foam earplugs, remember to **roll**, **pull**, and **hold** when putting them in. Use clean hands to keep from getting dirt and germs into your ears!

1. **Roll** the earplug up into a small, thin "snake" with your fingers. You can use one or both hands.

2. **Pull** the top of your ear up and back with your opposite hand to straighten out your ear canal. The rolled-up earplug should slide right in.

3. **Hold** the earplug in with your finger. Count to 20 or 30 out loud while waiting for the plug to expand and fill the ear canal. Your voice will sound muffled when the plug has made a good seal.

**Check the fit** when you're all done. Most of the foam body of the earplug should be within the ear canal. Try cupping your hands tightly over your ears. If sounds are much more muffled with your hands in place, the earplug may not be sealing properly. Take the earplug out and try again.
Gloves
Always wear the correct glove for the job. Gloves are used for basic hand protection. Do not use gloves when working around rotating machinery and gears. A loose fitting glove can be pulled into rotating machinery or gears and injure your hand and arm. Knowing when not to wear gloves can be as important as knowing the correct glove to wear.

Always wear the correct ____________________ for the job.

Do not use gloves when working around ____________________ and ____________________.

Glove Selection
Choose your gloves carefully. Each type of glove is to be used for a specific purpose and will give excellent protection when used for the intended job. For example, some rubber gloves will disintegrate in certain chemicals, while other rubber gloves are perfect for the job. There are special cut-resistant gloves for galley workers and those who routinely perform cutting tasks. Ask, or check the SDS to get the right PPE. There is not a single type of glove that can protect against all hazards present in the workplace. There are times when gloves are not worn. You should always follow company policies on glove selection and use.

Cutting Tools
Cutting tools can present a hazard to your hands and other parts of your body. Cutting tools you may encounter can include pocket knives, machetes, bush knives, and hatchets. If you are using a cutting tool, always keep the tool sharp to minimize drag and the possibility of the tool slipping. Always cut away from yourself.

First Aid for Hand and Finger Injuries
Traumatic injuries include cuts requiring stitches, broken bones, severe burns, and amputations, which will require a doctor’s care. Wrap amputated parts in a clean cloth and ice water, but not directly on ice. They should be kept cool whenever possible and sent to the hospital with the victim. Keep victim calm and quiet with injury elevated until help arrives. Put direct pressure on any bleeding wound and raise the arm above the head to slow bleeding. Even small cuts can become infected. Report and treat all cuts, scrapes, punctures.

Contact injuries include skin diseases and temperature or chemical burns. Immediate first aid for burns is to run clean, cool water over the affected area for at least 15 minutes to ease the pain and reduce the severity of the burn. Try to send the appropriate SDS with the victim if they have suffered a chemical burn or incident.

Respiratory Protection
Respirators are necessary when working in or near environments that contain respiratory hazards that are not controllable by any other means. Confined space work areas, as well as work with asbestos, man-made mineral fibers (MMMF), such as fiberglass, or in hydrogen sulfide (H₂S), welding or sandblasting environments, are all areas that involve wearing respirators. Respirators must be kept clean and sanitary in order to assure functioning and to prevent the spread of contagious diseases.

Fit Test
Before you use a respirator, you must have a medical evaluation to ensure that you are capable of using one. You must be fit tested on the specific brand and type of respirator you will be using to ensure a good seal between the mask and your face. You must be trained in proper use and maintenance of specific respirators. Some companies do not allow workers to wear contact lenses with respirators and do not allow facial hair, sideburns, mustaches, or beards that can interfere with respirator seals.

You must be fit tested on the specific brand and type of respirator you will be using to ensure a good ____________________ between the mask and your face.
Types of Respirators
Two major types of respirators are used in our industry:

- Air-purifying
- Supplied-air

Air-purifying Respirators
An air-purifying respirator (APR) filters existing air and does not supply air or oxygen. There are several styles of APR and some have cartridges as filters. Masks vary from emergency types, half, and full-face masks. Cartridges are color-coded and usually give protection from specific atmospheric contaminants. It is important to match the style and cartridge to the environment. APRs, such as gas masks, do not provide protection in oxygen deficient environments. In such environments, a self-contained breathing apparatus should be used.

Supplied-air Respirators
Two major types of supplied-air respirators (SAR) are hoseline, which uses a regulator and an air hose connected to a facility air supply and self-contained breathing apparatus (SCBA). SCBAs are fully self-contained units. SCBAs or SARs with auxiliary self-contained air supply are the only type of respirators allowed in an environment that is immediately dangerous to life and health (IDLH).

Other PPE
Selection Guidelines
Depending on the type of work you do, you require other forms of PPE. The important thing to remember is that you have to use the PPE for it to protect you. Always select clothes based on the specific job and inspect them for holes, rips or excessive wear prior to reporting for work. If you need any PPE or have questions as to what is required, ask your supervisor.

Other PPE
Other PPE may include:

- Personal flotation devices
- Fire or flame retardant clothing
- Chemical suits
- Rain gear

Other PPE
Personal Flotation Device
Personal flotation devices (PFD), usually Type I (life jackets) or Type V (work vests) must be worn onshore while working in dock areas or areas above water, while loading or unloading barges, for the entire helicopter flight, and when boarding or departing from a boat. You must wear a PFD anytime there is a threat of drowning.

Fire or Flame Retardant Clothing
Many companies require fire or flame retardant clothing (FRC). FRC reduces burn injuries from fire or arc flashes. When selecting FRC, you will need to know the arc thermal protective value (ATPV) required by your company. ATPV is a measure of the FRC’s ability to protect you. The ATPV for various hazard classes can be found in NFPA 70E.

Chemical Suits
Chemical suits protect all, or portions, of the body based on the type used. Chemical suits can fail and allow chemicals into the suit. They must be inspected prior to every use or reuse. They should be decontaminated after use. If a suit cannot be decontaminated or are found to be defective or damaged, remove it from service.

Rain Gear
Besides protecting from rain, rain gear can protect against other types of inclement weather. It can be used as a barrier to wind, help retain body heat, as well as aiding in rescue due to its high visibility markings.
Hazard Communication

In 1983, OSHA published the Hazard Communication Standard (HCS), also known as the Right to Know law. This law gives workers the right to know certain things about the chemicals they work with or are exposed to. The law was written to protect worker safety on the job. Workers have a right to:

- Evaluations of all chemicals
- Written HCS programs
- Chemical inventories
- Safety data sheets (SDS)
- Labeling
- Employee training and compliance

An update to the HCS in 2012 modified the HCS of 1994 to align US practices with the Globally Harmonized System (GHS). The GHS is an international approach to hazard communication, providing consistent standards to classify chemicals according to their hazards. GHS includes all hazardous chemicals. The GHS also lays out a standardized approach to labels and SDSs. The parts of the HCS 1994 standard unrelated to the GHS remained mostly unchanged. There have been changes to language in order to align the revised HCS with the language used in the GHS. GHS is the foundation for the safe use of chemicals, risk management systems and hazard communication.

Because there is no international implementation schedule for the GHS, different regions will implement GHS at different times. It is expected that all existing hazard communication systems will need to be changed in order to comply with the GHS. The chart below lists the effective completion dates along with the requirements and those responsible for their implementation.

<table>
<thead>
<tr>
<th>Effective Completion Date</th>
<th>Requirements</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1, 2013</td>
<td>Train workers on new label elements and SDS format</td>
<td>Employers</td>
</tr>
<tr>
<td>June 1, 2015</td>
<td>Compliance with all modified provisions of the final rule, except:</td>
<td>Chemical manufacturers, importers, distributors and employers</td>
</tr>
<tr>
<td>December 1, 2015</td>
<td>The distributor must not ship containers labeled by the chemical manufacturer or importer unless it is a GHS label</td>
<td></td>
</tr>
<tr>
<td>June 1, 2016</td>
<td>Update alternative workplace labeling and hazard communication program as necessary and provide additional worker training for newly identified physical or health hazards</td>
<td>Employers</td>
</tr>
<tr>
<td>Transition period to the effective completion dates</td>
<td>May comply with either 29 CFR 1910.1200, the current standard or both</td>
<td>Chemical manufacturers, importers, distributors and employers</td>
</tr>
</tbody>
</table>
The GHS still gives workers the Right to Know, but it now also gives workers the Right to Understand. This change will help improve the safety and health of workers by clarifying communication regarding chemical hazards. The GHS provides a standardized approach through:

- Including detailed criteria for determining what hazards a chemical poses
- Assigning standardized label elements by hazard class and category
- Harmonizing the SDS format to access the information more efficiently and effectively

The three major areas of change to the HCS under GHS are hazard classification, labels and SDSs.

**Hazard Classification**
Classification is the first part of hazard communication. It involves the identification of hazards by assigning a category of either a hazard or a danger by using a set of criteria. The term “hazard classification” is used to indicate that only the basic hazardous properties of substances and mixtures are considered:

- Identifying relevant data regarding the hazards of a substance or mixture
- Subsequent review of those data to ascertain the hazards of the substance or mixture
- A decision on whether the substance or mixture will be classified as a hazardous substance or mixture and the degree of the hazard

OSHA divides chemical hazards into two categories: physical hazards and health hazards. HCS informs all at-risk individuals that to these chemicals’ presence, the permitted exposure limits, the required PPE, and safe handling practices. Chemical manufacturers must evaluate their chemical products for physical and health hazards. They must create an SDS for each chemical. Employers must have a written HCS program and maintain an inventory of chemicals on site. Additionally, companies must train their employees how to use the site HCS process and ensure compliance.

**Labels**
Product warning labels are used to effectively communicate the specific hazards of a substance or chemical in the workplace. Products under the GHS will carry the GHS label once they are transferred to the workplace. Under the HCS, the label manufacturer must identify the chemical and the correct hazard warnings. Product warning labels consist of colors, shapes, numerals, and terms to describe the hazard. Warning labels must be prominently displayed on hazardous substance containers and must:

- Be consistent with HCS
- Not conflict with hazard warnings or pictograms
- Identify the chemical
- Provide name and address of manufacturer
- List appropriate hazard warnings
- Be legible
- Be written in English

Once the hazard classification is done, the HCS specifies what information is to be provided for each hazard class and category:

- Product identifier
- Supplier information
- Pictograms and symbolic labels
- Signal words
- Hazard statements
- Precautionary statements

OSHA divides chemicals into two categories: _______ and _______ hazards.
Pictograms, signal words and hazard statements are standardized and assigned hazard categories and classes. The standardized elements cannot differ from GHS and should appear on the GHS label as indicated in the GHS. The use of non-GHS symbols, signals words and hazard statements would be opposing information.

Pictograms contain graphic elements that convey specific information about chemical hazards. Each pictogram has a symbol on a white background within a red diamond. GHS uses nine pictograms to convey health, physical and environmental hazards. Only eight pictograms are required under HCS. Environmental pictograms are exempt under HCS because environmental hazards are not within OSHA’s jurisdiction.

### Physical Hazard Pictograms

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Explosive, self-reactive, organic peroxides" /></td>
<td>Explosive, self-reactive, organic peroxides</td>
</tr>
<tr>
<td><img src="image" alt="Flammable, pyrophoric, self-heating, self-reactive, organic peroxides, emits flammable gas" /></td>
<td>Flammable, pyrophoric, self-heating, self-reactive, organic peroxides, emits flammable gas</td>
</tr>
<tr>
<td><img src="image" alt="Corrosive (chemical reaction with metal)" /></td>
<td>Corrosive (chemical reaction with metal)</td>
</tr>
<tr>
<td><img src="image" alt="Gas under pressure" /></td>
<td>Gas under pressure</td>
</tr>
<tr>
<td><img src="image" alt="Oxidizer" /></td>
<td>Oxidizer</td>
</tr>
</tbody>
</table>

### Health Hazard Pictograms

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Cardiogenic, mutagenicity, target organ toxicity, reproductive toxicity, respiratory sensitizer, aspiration toxicity" /></td>
<td>Cardiogenic, mutagenicity, target organ toxicity, reproductive toxicity, respiratory sensitizer, aspiration toxicity</td>
</tr>
<tr>
<td><img src="image" alt="Corrosive (can damage eyes, lungs or skin)" /></td>
<td>Corrosive (can damage eyes, lungs or skin)</td>
</tr>
<tr>
<td><img src="image" alt="Irritant, narcotic effects, dermal sensitizer, respiratory tract, irritation (less severe toxicity)" /></td>
<td>Irritant, narcotic effects, dermal sensitizer, respiratory tract, irritation (less severe toxicity)</td>
</tr>
<tr>
<td><img src="image" alt="Severely toxic" /></td>
<td>Severely toxic</td>
</tr>
</tbody>
</table>

### Environmental Hazard Pictogram

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Environmental (acute toxicity)" /></td>
<td>Environmental (acute toxicity)</td>
</tr>
</tbody>
</table>
Common symbolic warning labels used today include the NFPA 704 and HMIS labels. OSHA has not replaced the warning signs used by the NFPA to warn emergency responders about hazards in warehouse storage.

The National Fire Protection Association (NFPA) 704 label is the most common symbolic hazardous material labeling system. The numbers 0 through 4 are used to identify the relative degree of the hazard. The number 0 indicates minimal or no hazard. The number 4 indicates a high hazard. The colors indicate the type of hazard:

- Red - fire hazard
- Yellow - reactivity
- Blue - health hazard
- White - special hazard

The Hazardous Materials Identification System™ (HMIS) label is very similar to the NFPA label. Both labels use colors to identify the hazard type and both labels use numbers to identify the relative degree of the hazard. However, one main difference between the two labels is the white section. The white section on the HMIS label uses letters to indicate the different types of PPE worn when working with that chemical.

**Labels and Placards**

Labels and placards are very similar to one another. The main difference between the two is that labels are usually smaller than placards. These labels are only required to be about four inches per side. Labels will be used on individual packages of non-bulk shipments. Placards will look the same as a hazmat label, except that they are larger. Placards are large, brightly colored, diamond-shaped signs which are meant to be read from a far distance by emergency responders. Placards must be applied to all four sides of bulk shipments of hazmat and must be able to be seen from all four sides. DOT and other groups use the diamond shape as a standard way to signify warning signs. Both labels and placards will usually display a symbol at the top to signify the hazard that is present. They will have a hazard description in the middle, such as poisonous gas. Color-coding is also used to indicate the hazard present. Placards will sometimes display the UN ID number in the middle instead of a description. This will allow emergency responders to reference the DOT Emergency Response Guidebook to find the exact chemical present and respond accordingly. Numbers will be displayed at the bottom which will indicate the hazard class or hazard class and division. For certain materials, letters will be displayed above the hazard class to indicate compatibility groups.

**NFPA 704 and HMIS labels are common ___________ warning labels used in the industry today.**
DOT and other groups use the diamond shape as a standard way to signify warning signs. Numbers at the base of the diamond shaped placard indicate the DOT hazardous material class.
Safety Data Sheets

Material Safety Data Sheets (MSDSs) are now referred to as SDSs in order to align the HCS with GHS. The SDS gives detailed information about the hazards of a specific material and how to control them. HCS 2012 requires the information on the SDS to be presented using specific headings in a particular sequence. The format of the 16 section SDS includes the following:

- Section 1 - Identification
- Section 2 - Hazard identification
- Section 3 - Composition/information on ingredients
- Section 4 - First aid measures
- Section 5 - Firefighting measures
- Section 6 - Accidental release measures
- Section 7 - Handling and storage
- Section 8 - Exposure controls/personal protection
- Section 9 - Physical and chemical properties
- Section 10 - Stability and reactivity
- Section 11 - Toxicological information
- Section 12 - Ecological information
- Section 13 - Disposal considerations
- Section 14 - Transport information
- Section 15 - Regulatory information
- Section 16 - Other information

You will be provided with the necessary information on all hazardous chemicals by labeling, SDS, and employee training. The appropriate SDS must be maintained in a binder or station convenient to the area where the chemical is used. Alternatively, an online database may be used.
Sample Safety Data Sheet

Methyl Ethyl Ketone
Revision date 14.02.2012

1. Identification of substance/mixture and of the company/undertaking
   - Trade name: Methyl Ethyl Ketone
   - Synonyms: Methyl Ethyl Ketone, 2-Butanone, 3-Butanone, Methyl Acetone, Ethyl Methyl Ketone
   - Use: Solvent, raw material for printing inks and printing ink additives, paint related material, for industrial use only
   - Distributor: Name: [Address: [Phone:]

2. Hazards Identification
   - Labeling
     - Signal Word: DANGER
     - Regulatory base: 67/548/EEC
     - Symbol(s): H411: Highly flammable; H315: Irritating to eyes
     - R-phrase(s): R36: Irritating to eyes;
     - S-phrase(s): S2: Keep out of reach of children;
     - Hazardous components which must be listed on the label: Butanone; Ethyl Methyl Ketone
     - Identification of the risks: 11: Highly flammable;
     - 36: Irritating to eyes;
     - 66: Repeated exposure may cause skin dryness or cracking;
     - 67: Vapors may cause dizziness and dizziness

3. Composition/Information on Ingredients
   - Butanone; Ethyl Methyl Ketone
   - CAS-No.: 78-93-3
   - Symbol(s): G, X, I
   - For the full text of the R-phrases, see section 1.6
   - Contents: ≤ 99.50% W/W
   - Index No.: 606-002-00-3
   - EC-No.: 201.159.0

4. First Aid Measures
   - General advice: When symptoms persist or in all cases of doubt, seek medical advice
   - Inhalation: Move to fresh air in case of accidental inhalation of vapors; if breathing is irregular or stopped, administer artificial respiration; call a physician immediately.
   - Skin contact: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes; wash contaminated clothing before re-use; if skin irritation persists, call a physician.
   - Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
   - Ingestion: If swallowed, seek medical advice immediately and show this container or label; do not induce vomiting without medical advice; never give anything by mouth to an unconscious person.

5. Firefighting Measures
   - Suitable extinguishing media: Water spray, alcohol-resistant foam, dry chemical, carbon dioxide (CO2)
   - Extinguishing media which must not be used: No information available
   - Specific hazards during firefighting: Vapors may form explosive mixtures with air; flash back possible over considerable distance
   - Special protective equipment: Wear self-contained breathing apparatus and protective suit
   - Further information: Cool containers/tanks with water spray.

6. Accidental Release Measures
   - Personal precautions: Keep people away from and upwind of spill/leak and remove all sources of ignition; do not breathe vapors or spray mist; material can create slippery conditions.
   - Environmental precautions: Should not be released into the environment; prevent further leakage or spillage if safe to do so.
   - Methods for cleaning up: Soak up with inert absorbent material and dispose of as hazardous waste.

7. Handling and Storage
   - Safe handling advice: Provide sufficient air exchange and exhaust in work rooms; wear personal protective equipment; ensure all equipment is electrically grounded before beginning transfer operations; take precautionary measures against static discharges.
   - Advice on protection against fire and explosion when handling: Keep away from heat and sources of ignition; use explosion-proof equipment.
   - Requirements for storage areas/containers: Keep containers tightly closed in a dry, cool and well-ventilated area.
8. Exposure Controls/Personal Protection

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Control Parameters</th>
<th>Update</th>
<th>Boss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>TWA</td>
<td>600 mg/m³</td>
<td>12 2009</td>
<td>EU Exposure Limit Values</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>200 ppm</td>
<td>12 2009</td>
<td>EU Exposure Limit Values</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>900 mg/m³</td>
<td>12 2009</td>
<td>EU Exposure Limit Values</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>300 ppm</td>
<td>12 2009</td>
<td>EU Exposure Limit Values</td>
</tr>
</tbody>
</table>

Engineering measures
Provide sufficient air exchange and exhaust in work rooms

Personal protective equipment

Respiratory protection
In case of insufficient ventilation, wear suitable respiratory equipment

Hand protection
Gloves suitable for permanent contact:

- Material: butyl-rubber
- Break through time: 4 hours
- Material thickness: 0.3 mm

Eye protection
Safety glasses with side shields

Skin and body protection
Protective suits and safety shoes

Hygiene measures
Wash hands before breaks and immediately after handling the product

Protective measures
Wear suitable protective equipment

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>State of matter</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Miscible</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/</td>
<td>-86.3°C</td>
</tr>
<tr>
<td>Boiling point/</td>
<td>79.6°C</td>
</tr>
<tr>
<td>Flash point/</td>
<td>9°C, closed cup</td>
</tr>
<tr>
<td>Flash point</td>
<td>9°C, open cup</td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

- Materials to avoid: Strong oxidizing agents, incompatible with acids, Halogenated compounds
- Hazardous decomposition products: Carbon oxides
- Hazardous reactions: Hazardous polymerisation does not occur

11. Toxicological Information

Acute oral toxicity
LD50 rat: 2,737 mg/kg; literature value

Acute inhalation toxicity
LC50 rat: 23,500 mg/m³ 8 hours; literature value

Acute dermal toxicity
LD50 rabbit: 6,480 mg/kg; literature value

Skin irritation
Rabbit: moderately irritating; literature value

Eye irritation
Rabbit: irritating; literature value

12. Ecological Information

- Ecotoxicity effects
  - Toxicity to fish
  - LC50 Lepeos macquarii (bluegill sunfish): 4,467 mg/l; 96 hours; literature value
  - LC50 Pseudorhabdosynochus: 5,700 mg/l; 24 hours; literature value
  - LC50 Pimephales promelas: 3,200 mg/l; 96 hours; literature value

- Toxicity to Daphnia and other aquatic invertebrates
  - LC50 Daphnia magna: <320 mg/l; 48 hours; literature value

13. Disposal Considerations

- Product
  - In accordance with local and national regulations; do not contaminate ponds, waterways or ditches with chemical or used containers; the product should not be allowed to enter drains, water courses or the soil

- Contaminated packaging
  - Do not burn or use a cutting torch on the empty drum; triple rinse containers, can be offered for recycling, reconditioning or puncture

14. Transport Information

- ADR
  - UN number: 1193; Class: 3; Packaging group: II; F1; Description of the goods: ETHYL METHYL KETONE

- RID
  - UN number: 1193; Class: 3; Packaging group: II; F1; Description of the goods: ETHYL METHYL KETONE

- ADNR
  - UN number: 1193; Class: 3; Packaging group: II; F1; Description of the goods: ETHYL METHYL KETONE

- IMDG
  - UN number: 1193; Class: 3; Packaging group: II; Description of the goods: ETHYL METHYL KETONE

- ICAO/IATA
  - UN number: 1193; Class: 3; Packaging group: II; Description of the goods: Methyl ethyl ketone

15. Regulatory Information

- SARA 313 (40 CFR 372.65C) Supplier Notification
  - No ingredients in this product are subject to SARA 313 (40 CFR 372.65C) Supplier Notification

- TSCA Certification
  - All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory

16. Other Information

- Full text of R-phrases referred to under Sections 2 and 3
  - R11: Highly flammable
  - R36: Irritating to eyes
  - R66: Repeated exposure may cause skin dryness or cracking
  - R67: Vapors may cause drowsiness and dizziness
Chemical Inventory
Employers must keep an up-to-date inventory of all hazardous chemicals kept onsite. Each chemical listed in the inventory must have a SDS and employees should be trained to use the inventory list to identify chemicals.

Training Requirements
Your employer should provide HazCom training as part of your orientation process and when any new physical or health hazards are introduced at the jobsite. When an employee is first hired they require training on hazards, PPE, the company’s HazCom program and exposure limits. After your training, you should know which operations have hazardous chemicals present and the location and availability of the company’s written HazCom program, hazardous chemical inventory and SDSs. You should also know how to determine the presence or release of hazardous chemicals and what physical and health hazards are presented by chemicals in your work area as well as how to protect yourself from them. Your employer should cover the details of the HazCom program including the labeling system used, how to use an SDS and methods available to obtain and use hazard information.

Warning Signs and Tags
A hazard can be represented as different levels or degrees of danger. The color of warning signs or tags can be an indication of the level of the hazard:

- Immediate hazards – red and/or black on white
- Potential hazards – black on yellow
- Safety instructions – green on white

<table>
<thead>
<tr>
<th>Sign</th>
<th>Use</th>
<th>Color Scheme</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
<td>Immediate Hazards</td>
<td>Red and black on white</td>
<td></td>
</tr>
<tr>
<td>Caution/Warning</td>
<td>Potential Hazards</td>
<td>Black on yellow</td>
<td><img src="example.png" alt="Caution" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Black on orange</td>
<td><img src="example.png" alt="Warning" /></td>
</tr>
<tr>
<td>Safety</td>
<td>Safety Instructions</td>
<td>Green on white</td>
<td><img src="example.png" alt="Safety" /></td>
</tr>
</tbody>
</table>

The color of warning ________________ or ________________ can be an indication of the level of the hazard.

Warning Labels
Warning labels are required on hazardous material containers. The label must contain the same product name and all physical and health hazards as on the SDS. Symbolic labels may be used to identify physical and health hazards.

________________________ are required on hazardous material containers.
Environmental Regulations, Compliance and Reporting
Regulations are at both federal and state levels and can be enforced by fines (civil), imprisonment (criminal), and forced cleanup of areas (cleanup). Monitoring is a key part of compliance and auditors may visit your workplace to verify practices. Your company may also be required to submit various reports to ensure they are in compliance. Reporting is part of the law and includes reporting all spills and releases.

Roles and Responsibilities
Your employer has the responsibility to adequately train you and provide you the resources to carry out your role in supporting environmental practices. The people who manage and supervise you should provide the guidance necessary to ensure you know what to do. You have the responsibility to sort all waste in accordance with your company procedures and not dump or release anything to the environment. Report all violations to your supervisor.

Hazardous Waste Operations and Emergency Response
The dumping of hazardous substances poses a significant threat to the environment. Hazardous substances are a serious safety and health problem. Humans, animals, and the environment can become endangered if these materials are not properly treated, stored, or disposed. Because of the severity of this problem, OSHA issued the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard for all companies who perform hazardous waste cleanup operations, hazardous waste operations that are conducted at treatment, storage, and disposal (TSD) facilities, and emergency response operations involving hazardous substance releases. Untrained workers should not respond to a hazardous spill.

Spill Response and Reporting
Every effort should be made to prevent spills and leaks. In the event that a spill or leak is observed, the first concern should be to attempt to stop the cause of the release, and then to contain the release. Your supervisor should be informed immediately after the initial response.

Emergency Response – Awareness Level
First responders at the awareness level are limited to witnessing or discovering a hazardous substance release. They have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They take no further action beyond notifying the authorities of the release. A specific number of hours are not mandated for first responder awareness level training.

If you find an uncontrolled or unauthorized release of a hazardous material, report the incident to your supervisor. Do not take action to control or contain a release. Do not try to clean up the release unless you have the proper training and equipment. In order to protect yourself from exposure to hazardous materials, you must only respond to the level of your training.

In order to protect yourself from exposure to hazardous materials, you must only respond to the level of your training.

General training for awareness level workers will allow them to:
- Recognize a release
- Activate emergency response plan
- Establish initial site control
- Identify and define hazardous materials
- Be aware of risks and potential outcomes associated with those hazardous substances
- Know their role in an emergency response
- Recognize the need for additional resources
Emergency Response Guidebook
The Emergency Response Guidebook (ERG) contains emergency response information in the form of guides for each hazardous chemical. There are four color-coded sections:
- Yellow – Listed by UN ID number
- Blue – Listed by chemical name
- Orange – Guide section
- Green – Isolation distances

Hazardous Waste
Materials should be used in a manner that minimizes the amount of waste generated. One way to minimize waste is through recycling. Recycling is the collection and reuse of waste and some items can be returned to the vendor. Company procedures provide information on both methods. Segregating waste into hazardous and non-hazardous provides another way to minimize waste. It is important to remember that for every piece of trash there is a specific waste container where the trash should be placed. Nothing should be placed in a waste receptacle until it is absolutely clear that the waste is being placed in the proper container. Waste containers should be properly identified showing the type of waste material to be collected. Each waste stream is handled separately. It should be marked throughout its storage and shipping. If all wastes are mixed together, they form a “gumbo” and the whole mix must be treated as hazardous waste.

Hazardous Waste
- Solid waste – Solid materials that are not hazardous.
- Exploration and production waste – Waste associated with drilling and the production of oil and gas. It is exempt under EPA regulations, although state regulations may control it.
- Universal waste – Can be recycled and not considered hazardous although they must go to an approved facility.
- Hazardous waste – Wastes that can be harmful to people or the environment and must receive special handling.

It is illegal to throw any material, liquid or solid, and especially plastics overboard from platforms, docks, boats. Your company can be heavily penalized for noncompliance with these regulations. Site specific procedures (including JSEAs) that are specific to a variety of potential problem areas may be addressed, including the handling of wastes, spills and the protection of wildlife and vegetation. The site specific orientation should address these issues.

Transportation of Hazardous Materials
DOT states that a hazmat is a material that has been determined to be capable of producing unreasonable risk to health, safety, and property when transported in commerce and has been so designated. If you are responsible for shipping hazmat, you must be familiar with specific requirements. Typically, a shipment must contain a SDS, be properly packaged and labeled, and have a shipping manifest. If you are involved in transportation of hazardous materials, your company will provide in depth training on the procedures and practices you must follow.
Industrial Hygiene and Occupational Health

Everyone in the company has responsibility for industrial hygiene and occupational safety and health. Managers and supervisors must ensure compliance with policies and procedures as well as communicating goals and objectives to employees. You are responsible for working in accordance with procedures and the direction of your supervisor.

Exposure

You should know the hazards present in the workplace and wear the necessary PPE to protect yourself from exposure. Exposure can occur through absorption, inhalation, ingestion, radiation, or noise. Since our bodies are at risk for exposure, take measures to monitor and mitigate that exposure.

Monitoring and Mitigating

To minimize the risk of exposure, follow established exposure limits and monitor through manual and automated sampling. Hazard mitigation follows a hierarchy. First try to eliminate the hazard completely. If that is not possible, then try to substitute for a less hazardous situation. Physically mitigate hazards through engineering controls and if hazards still exist, use administrative controls to control work practices. If there is still an exposure hazard, workers are required to wear PPE. That means PPE is the last resort to prevent exposure.

Where to Find Hazard Information

There are many places to find information on workplace hazards. Your company has orientations. The host facility will have site specific orientations. You will be involved in job planning meetings before performing work. You will have access to SDS information. There are placards and warning signs at each jobsite to provide safety information.

Health Hazards

The purpose of industrial hygiene and occupational safety and health is to protect the safety and wellbeing of workers by reducing or eliminating health hazards. Several types of health hazards that can be found in the workplace include:

- Chemical
- Physical
- Biological
- Ergonomic

Chemical Hazards

Hydrogen Sulfide

Hydrogen sulfide (H₂S) is a highly toxic, colorless gas that is formed by the decay of organic materials. It also can be produced in a variety of industrial processes. You cannot develop a tolerance to H₂S. It is one of the leading causes of sudden death in our industry. H₂S has the following characteristics:

- Toxic - H₂S deadly to humans and animals. When exposed to high concentrations, it can cause death in a very short period of time. H₂S can be fatal at levels of 750-1000 ppm.
- Colorless
- Offensive odor - At low concentrations, H₂S may have a rotten egg odor. The odor indicates the presence of H₂S, but does not indicate the concentration. At high concentrations greater than 100 ppm, H₂S impairs the sense of smell. Do not depend on your sense of smell to detect the presence of H₂S.
- Soluble - H₂S is soluble in water and hydrocarbons.
- Corrosive - H₂S is highly corrosive to certain metals such as copper, iron and silver.
- Heavier than air - H₂S is 20% heavier than air.
- Flammable - H₂S is flammable when mixed with air. 500°F will produce ignition at 4.3% to 46% atmospheric concentrations.
- Produces toxic bi-products - When ignited, H₂S produces sulfur dioxide (SO₂). SO₂ is extremely hazardous when inhaled and may lead to pneumonia and respiratory damage.

The greatest danger of H₂S is death by inhalation. Specific training is required to work or enter an H₂S environment. Signs should be posted in known H₂S areas and these areas should be monitored for H₂S concentration levels.

Do not depend on your sense of smell to detect the presence of ________________________.
Naturally Occurring Radioactive Material
Naturally occurring radioactive materials (NORM) may occur in oil and gas formations. It may end up as scale buildup in tubulars, wellheads, flowlines, pits, drill pipe, production vessels, separators, shale shakers, produced waste water and saltwater disposal well equipment. Because high levels of radiation can cause cancer, NORM can pose a serious health risk. This requires taking steps to protect ourselves when working in contaminated areas. NORM is primarily an inhalation/ingestion hazard. The main danger of NORM is the inhalation of contaminated materials. NORM training will advise you of the recommended work practices and required PPE.

Benzene
Benzene is a clear, colorless liquid with a sweet, distinctive odor. It is also potentially toxic, flammable, and volatile. Benzene may be present in many liquid mixtures, such as crude oil and condensate, gasoline, refinery and petrochemical process streams, and some solvents. Avoid inhaling, swallowing, or allowing contact with your eyes and skin. Long term or chronic exposure may result in the development of blood disorders ranging from anemia to leukemia.

Organic Solvents
Exposure to toluene or any other organic solvent may cause chronic health problems. This can be the result of a large exposure for a short period of time or exposure to relatively small amounts over an extended period of time. Organic solvents are a fire hazard.

Carbon Dioxide and Nitrogen
Carbon dioxide (CO₂) and nitrogen (N₂) are non-toxic, non-flammable, colorless, tasteless and odorless gases. Both CO₂ and N₂ are heavier than air and tend to accumulate in low-lying areas. Even though both gases are non-toxic, they can still cause death. Breathing either gas for an extended period will block the uptake of oxygen, stimulating breathing and increasing the heart rate. This can result in discomfort, nausea, and ultimately unconsciousness and death.

Lead
Lead is a heavy metal. It is typically found in paints and coatings. Workers can be exposed to lead by dust or fumes. Fumes are created when lead is heated (welding/soldering). Fumes are easier to breathe and therefore may be more dangerous than dust. You should be tested regularly if you are working in a risk area for lead exposure. Always wear the approved PPE for working in areas where there is lead contamination.

Mercury
Mercury is a silver liquid at room temperature. It can alloy or combine with many metals. It is inside such things as lights and instrumentation. The major pathways for exposure are inhalation, ingestion and absorption. Exposure to mercury can cause kidney failure, respiratory failure and even death. If mercury is spilled, a spill response kit must be promptly used to collect the mercury. PPE such as respirators, goggles and gloves must be used according to company spill procedures.

Diethanolamine
Diethanolamine (DEA) is a white solid or colorless liquid normally used to scrub gasses and can be found as a component of drilling fluids. Exposure to DEA can be through the eyes, skin or inhalation. Repeated skin contact can cause dermatitis with chronic exposure causing aggravation of any existing kidney or liver disease. DEA is a known carcinogen. PPE such as chemical resistant gloves, chemical goggles, coveralls or lab coats and respirators can be used to protect against DEA.

Methanol
Methanol is also known as wood alcohol. It is a light, volatile, colorless, flammable liquid used for hydrate inhibition in natural gas production. Exposure to methanol occurs through inhalation and absorption through the skin. Do not drink methanol. It can cause blindness and even death. The minimum protection for methanol is appropriate gloves and safety glasses with side shields.

Hexavalent Chromium
Hexavalent chromium is colorless to pale yellow and has a suffocating odor. It dissolves completely in fluids and can be found in welding rods, stainless steel, surface coatings, electroplating, paints and pigments. Exposure to hexavalent chromium occurs through inhalation, absorption through the skin and ingestion. It is poisonous when ingested and causes itching, burning and dermatitis on skin. It can severely irritate mucous membranes and can affect people who have bronchial asthma. Protection from hexavalent chromium is afforded by engineering controls, safe work practices for welding, and the use of respirators.
Physical Hazards
Inhalant Hazards
Fiberglass and other man-made mineral fibers (MMMF) should be handled properly. Do not drill, cut, mine, tear, remove or disturb a material that you suspect contains asbestos. They are primarily an inhalation hazard. Other examples of MMMF are fiberglass and refractory ceramic fiber. Only properly outfitted personnel should handle these materials.

There are many types of dusts that can cause health problems if proper precautions are not taken. Silica dust, paint dust, including lead particles, high air pressure and high noise levels all pose hazardous threats to those working near sandblasting.

Hydraulic fracturing sand contains up to 99% silica. Transporting, moving and refilling silica sand into and through sand movers, along transfer belts and into blender hoppers can release dusts containing silica into the air. Workers can be exposed if they breathe the dust into their lungs. Breathing silica can cause an irreversible but preventable disease called silicosis.

Painting involves many of the same hazards as sandblasting. Toxic vapors from paint solvents and spray mists are areas of concern. Additionally, fire hazards due to paint solvents are another cause for caution. Other hazards such as compressed air and various fumes, dusts, smoke, aerosols, mists, gases and vapors are common in exploration and production operations. Often there is no obvious indication that these health hazards are present.

Adverse Weather
Adverse weather conditions include events such as lightning, snow and ice, windstorms, flooding, ultraviolet radiation and extreme temperatures. All of these conditions are of concern for the oil and gas industry. The primary concern is employee safety when adverse weather conditions present a potential risk.

- The primary concern is __________ safety when adverse weather conditions present a potential risk.

Lightning
If lightning is spotted in the area, follow local response procedures. If you are outside go to the closest building or vehicle and avoid all metal objects, water, high ground and open spaces. Some places are not safe and include being under canopies, picnic shelters or trees.

Snow and Ice
There are a variety of hazards associated with working in winter weather. Some of these hazards include:
- Driving accidents due to slippery roadways
- Carbon monoxide poisoning
- Slips and falls due to slippery walkways
- Hypothermia or frostbite due to exposure
- Being struck by falling objects such as icicles, tree limbs, or utility poles
- Electrocuton due to downed power lines or downed objects that are in contact with power lines
- Falls from heights while removing snow from roofs or skylights
- Roof collapse from the weight of snow
- Burns from fires caused by energized line contact or equipment failure
- Exhaustion from working extended shifts
- Dehydration, back injury or heart attack while removing snow

Windstorms
Windstorms include tornadoes and hurricanes. Both can cause severe damage. There is no guaranteed safety in a tornado. If a tornado strikes, go to the lowest floor in the building. Do not use elevators. You could be trapped if the elevator becomes disabled. Once on the lowest floor, move to the center of the building, stay away from windows, crouch down and cover your head. If you are in the open outdoors, seek shelter in a building. If a building is not available, go to low ground, stay away from trees and vehicles, lie flat with your face down and protect your head. If you are in a vehicle and the tornado is far enough away, drive at right angles to the path of the tornado to escape. If there is not enough time to escape, safely park the vehicle, exit the vehicle and seek a building or low ground. Hurricanes are more predictable and preparation is the best protection.
The National Weather Service (NWS) in conjunction with the National Oceanic and Atmospheric Administration (NOAA) will issue emergency information with hurricanes. A hurricane watch means the threat of hurricane is within 36 hours and you should be ready to act. A hurricane warning means hurricane conditions will exist within 24 hours and you should complete all storm preparations, and leave the area if directed by authorities.

Flooding Alerts are issued regarding flooding hazards.
- Flood watch - flooding is possible and you should listen to a weather radio for more information
- Flood warning - flooding is occurring or will occur soon and you should evacuate if advised to do so
- Flash flood watch - flash flooding is possible and you should be prepared to move to higher ground
- Flash flood warning - flash flooding is occurring and you should seek higher ground immediately

Ultraviolet Radiation Exposure to sunlight which has ultraviolet (UV) radiation can cause premature aging of the skin, wrinkles, cataracts and skin cancer. To protect yourself from UV radiation, limit exposure, cover up exposed body parts, use a 30+ SPF sunscreen, wear a hat and UV absorbent sunglasses.

Heat Stress Prior heat injury predisposes an individual to future injury. Age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or drugs, and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat. Although all heat related illnesses can be dangerous, heat stroke is a medical emergency. Heat stress can be induced by strenuous physical activities conducted outdoors. These may include:
- In hot weather
- Near heat sources
- In high humidity
- In direct physical contact with hot objects
- When wearing semi-permeable or impermeable protective clothing

Cold Stress Low temperatures, high/cool winds, dampness and cold water are four environmental conditions that cause cold stress. Wind chill, a combination of temperature and velocity, is a crucial factor to take into consideration when working outside. Working in wet conditions can increase the risk of hypothermia. Hypothermia occurs when body temperature falls to a level where normal muscular and cerebral functions are impaired. Hypothermia is generally associated with freezing temperatures, but can occur whenever body temperature falls below normal. Hypothermia is a medical emergency.

Biological Hazards Wildlife Wildlife can present hazards in two ways, biological hazards and vector-borne hazards. Do not approach wildlife and be aware of site specific biological hazards when working outdoors.

Biological hazards include insects and scorpions, poisonous plants, venomous spiders and venomous snakes. If you are bitten or stung, you can experience anaphylactic shock. Anaphylactic shock is an allergic reaction that can occur within seconds or minutes causing your blood pressure to drop and your airways to narrow. This can be a life threatening occurrence and requires immediate medical attention.
Vector-borne diseases are spread by insects, such as mosquitoes and ticks, which are the vectors. Mosquitoes can spread West Nile virus and several types of encephalitis. Encephalitis is a severe swelling or inflammation of the brain. Ticks are second only to mosquitoes in their ability to spread diseases to humans. Several diseases as well as some of the better known being Lyme disease and Rocky Mountain spotted fever are transmitted by the saliva of ticks as they feed. Some reactions from tick bites can occur within seconds. If fever, headache or rash occurs, seek medical attention.

### Biological Agents

Biological agents include bacteria, viruses, fungi (yeasts and molds) and parasites. Exposure to biological agents can come from organic dusts such as common dust and animal dander, natural or organic materials such as hay or straw, substances of animal origin such as wool or hair, food, waste or wastewater and blood and body fluids either animal or human. Biological agents can cause diseases such as infections, allergies and poisoning or toxic effects. Some can cause cancer or fetal harm. Biological agents can enter the body through damaged skin or mucous membranes, inhalation, ingestion, animal bites and needle sticks.

#### Protection from Biological Agents

Several things can be used as protection from biological agents:

- Store food and drink in a way that will prevent contamination from chemicals, oils, dirt, biological agents or other foreign substances. Whenever possible prepare and eat food away from the workspace, especially if the strong possibility of contamination exists at the jobsite.
- Practice good personal hygiene.
- Avoid contact with potentially contaminated animals.
- Practice dust and aerosol prevention measures.
- Use proper PPE.
- Report anything that is unusual, such as changes in taste or color of water. With the threat of terrorism, be aware of suspicious activities that may indicate tampering with food or drink supplies.

### Ergonomic Hazards

Back problems account for over 40% of the costs associated with worker compensation claims. Back injuries strike one in five adults every year. Many back problems are self-inflicted by using improper lifting techniques and through bad judgment when lifting or moving objects. 80% of adults have suffered back pain.

#### Many back problems are self-inflicted by using improper __________________________ techniques.

### Avoiding Back Injuries

Back safety should be a priority.

- Stay in shape. Declining physical fitness creates problems. Keep active – exercise the muscles in your back, stomach, hips and thighs to keep them strong and flexible.
- Practice lumbar stabilization techniques – back should bow in, never out
- Use proper lifting techniques – use the legs when lifting objects, not the back muscles. Keep your back straight and knees bent. Do not twist your body while carrying a heavy load. Keep the load as close to your body as possible.
- Transfer upper body weight to knees or a stable handhold to help support the weight of the load
- Never try to lift more than you can safely handle. Consider size, shape and weight. Get help if needed. If sharing the load with another person you should plan lifting and lowering, so that neither of you is hurt.
- Release stress to back by arching, flexing and stretching throughout the day.
- Eliminate negative aspects to your lifestyle. Weight gain and smoking are detrimental to back health. One pound overweight adds four pounds of extra force on the spine.
- Pay attention to your posture – sitting, standing or working in a slumped or bent posture for hours can irritate your back and lead to long-term back pain.

_______________ safety should be a priority.
**Why Back Injuries Occur**

Every time you bend over at the waist, lift a heavy object or sit leaning forward, you put stress on your back and spine. Over time, the parts of your spine degenerate and become damaged causing back pain. Improper lifting techniques can cause sudden damage to the spine as well.

Think of your back as a lever. With the fulcrum in the center of the lever, it only takes 10 pounds of pressure to lift a ten pound object.

However, if you shift the fulcrum to one side, it takes much more force to lift the same object. Your waist actually acts like the fulcrum in a lever system, and it is not centered.

When you add in the 105 pounds of the average human upper torso, you see that lifting a ten pound object actually puts 1,150 pounds of pressure on the lower back.

If you were 25 pounds overweight, the extra weight increases your upper torso to 130 pounds. That would add an additional 250 pounds of pressure on your back to 1,400 pounds every time you bend over.

**Safety Tips**

Know your limitations and get help if you need it. Do not twist at the waist while lifting and always use caution when lifting in situations such as overhead, over a table or out the bed of a truck. Awkward and bulky loads can be hard to handle even if they are not heavy. Use caution with them and get help if needed. When carrying a load be alert to prevent slips, trips and falls. There are alternatives to lifting such as dollies, carts or powered lift equipment.

If you can, use a dolly or cart. It is safer to push than to pull. Cranes, hoists, lift tables or forklifts are examples of powered lift equipment. Ensure you meet all the qualifications for operating them.

**Lifting Tips**

Minimize problems with back pain by keeping your back in good shape and by not stressing the components of your back; small, repeated damage over time can be as dangerous to your spine as one acute injury. Disc degeneration (herniated vertebrae, collapsed discs, shifted vertebrae and bone spurs) can cause debilitating pain. Protect your back. Immediate injuries to the back can be caused by tearing or straining ligaments and muscles. Muscle spasms can also occur due to stress or tension. Small, repeated damage over time can be as dangerous as one acute injury. Torn or strained ligaments and muscles create immediate injury to the back.
Specialized Work Procedures
The purpose of specialized procedures is to comply with regulations, communicate work activities and aid in the prevention of accidents and releases. Several types of specialized work procedures can be found in the workplace.

The purpose of specialized procedures is to comply with regulations, communicate work activities and aid in the ________________ of accidents and releases.

Job Safety Analysis/Job Safety Environmental Analysis
The purpose of a job safety analysis/job safety environmental analysis (JSA/JSEA) is to ensure that the risks of a job are identified, understood and reduced as low as reasonably practicable to maintain safety awareness. JSAs can also be used as a communication tool for a workgroup to better understand a job and can even be used to train new employees. The JSA also provides approval signatures prior to starting work and in the event an incident occurs, can be used as an accident and incident investigation tool.

A JSA is an effective tool to be used to evaluate jobs, even when a work permit is not required. JSAs should be reviewed often and updated with input from both supervisors and workers who do the job every day. As an experienced employee, you can maintain safety awareness behavior and receive clear instructions for job changes or new jobs. You should be involved in worksite assessments such as JSAs. Your knowledge and experience should be incorporated into any written plan to correct and prevent safety and security hazards. Your supervisors will ensure a JSA is completed prior to work and involve the whole team in its preparation. Once mitigation measures are identified, they should also follow through to see they are in place. You should participate and provide input to the JSA and never be afraid to ask questions. Before the job, you should attend any tailgate meetings where the job is discussed and if you find any changes in the work or hazards that are present, make sure the JSA is updated.

A JSA is created by separating the job into the basic ________________.

JSEA
Many host companies require a pre-job environmental assessment to determine if adequate safeguards are in place to prevent an environmental incident, discharge or other permit violation. If you are presented such an evaluation at a jobsite, you should work closely with supervisors and safety officers to determine courses of action that will avoid problems that are specific to the job and outlined in the JSEA, such as:

- Community relations
- Handling of chemicals, oil and diesel
- Archaeological considerations
- Protection of wildlife and vegetation
- Flooding and hydrology
- Soil types
- Waste processing
- Access routes and traffic management
- Noise and vibration
- Air quality and wind speed

If there are special environmental precautions at your jobsite, the site specific orientation should address them. If in doubt, speak to your supervisor or the safety office before taking action. It can cost companies time delays and fines by disregarding site specific JSEA information.
## JOB SAFETY ANALYSIS

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<th>Hazards</th>
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**ACTIVITY**
List the tasks required to perform the activity in the sequence they are carried out.

**HAZARDS**
Against each task list the hazards that could cause injury when the tasks is performed.

**RISK CONTROL MEASURES**
List the control measures required to eliminate or minimise the risk of injury arising from the identified hazard.

**WHO IS RESPONSIBLE?**
Write the name of the person responsible (supervisor or above) to implement the control measure identified.
Work Permits
Work permits are written authorizations that specify the location and type of work to be performed. It ensures that the hazards have been evaluated by a qualified person and that the necessary protective measures have been taken to protect the worker. It also provides permission to start work. Work permits are a proactive strategy to reduce accidents and incidents.

Work permits are written authorizations that specify the ___________ and ___________ of work to be performed.

Roles and Responsibilities
The individual designated to authorize permitted work is called the authorizing person. The HSE person monitors the work. Managers must ensure the permits are being issued and also monitor the work permit program while supervisors and leads ensure you are trained and that conditions for the permitted work are met. Your responsibility is to perform work in accordance with conditions that are stated in the permit.

Examples of Work Permits
Some examples of work permits are:
- Confined space refers to a space or work area where there are limited openings for entry and exit and where there is unfavorable natural ventilation. It may contain or produce air contaminants and is not designed for continuous employee occupancy.
- Hot work permits are required under any circumstance where an operation will or could create a fire hazard by creating an open flame, spark or other ignition source.
- Lockout/tagout is required when working on equipment or process systems to prevent accidental or inadvertent energizing.

Some examples of work permits are ___________ and ___________.

Other Permits
- Barricading - This permit is generally required prior to any barricading to ensure that access of emergency vehicles is not impeded as result of the barricades, and to ensure that dangerous situations, such as potential fall hazards, are shielded by barricading.
- Utility hookup - This permit is required prior to connecting to any utility. An example would be to ensure that water volume and pressure is not reduced to below firefighting requirements.

Work Permit Policy
The work permit policy is there for your protection and the protection of your coworkers. Safety is a full time responsibility. The signed work permit also helps ensure that all affected parties are in the communication loop. Each operator that your company works for will have a formal work permit policy. It is your responsibility to know and follow it.

The contributing factors of most accidents are thoughtlessness, inattention, haste, or lack of knowledge. By following the proper steps, receiving the proper training, using good judgment, following safety rules and being alert, accidents and potential injuries can be avoided.
Hazardous Energy Control – Lockout/Tagout

Lockout refers to the placement of a lockout device, typically a lock, on equipment, valves, electrical lines or flowlines so they cannot be operated until the device has been removed. Tagout is similar, except that a special tag or other identifying device is placed on the equipment, valves or flowlines instructing that they must not be operated until the tagout device has been removed. LOTO helps keep equipment or process systems from being mistakenly energized during maintenance and servicing, especially when guards and safeties are disabled or removed. LOTO prevents unwanted contact with energy hazards.

_________________________ helps keep equipment or process systems from being mistakenly energized during maintenance and servicing.

All locks and tags must be supplied free of charge by the company and must contain a warning statement such as Do Not Remove and be capable of identifying the person who applied the device. They must be substantial enough to prevent accidental removal.

Lockout is the preferred method whenever possible, since lockout makes it practically impossible for anyone to accidentally activate the line or equipment. This is especially true if there are employees who do not read well or use English as a second language.

_________________________ is the preferred method whenever possible, since it makes it practically impossible for anyone to accidentally activate the line or equipment.

Energy

Energized means being connected to an energy source or containing residual or stored energy. It is very common for equipment to use several types of energy or use a single form of energy from multiple sources. Being locked or tagged out is more than just de-energizing. It is securing the equipment to make it safe to work on or near.

Potential Energy Sources

Potential energy sources can be:

- Electrical
- Mechanical
- Pneumatic
- Hydraulic
- Thermal
- Chemical
- All forms of potential stored energy

Energy Isolating Device

An energy isolating device is a mechanical device that physically prevents the transmission or release of energy. Examples may include a manually operated electrical circuit breaker, a disconnect switch, a manually operated switch, a line valve, or a block. The equipment must be isolated from its energy source and rendered inoperative prior to servicing or maintenance.
Roles and Responsibilities
For the purposes of the LOTO standard, there are three types of employees:
- Authorized
- Affected
- Other

Authorized Employee
Authorized employees perform LOTO. Authorized employees identify the types and magnitude of energy associated with the equipment to be removed from service. They must understand the hazards of the energy found on the jobsite and know the methods of control for them. The authorized employee notifies affected employees when a LOTO is removed. Only authorized employees can apply or remove a LOTO.

Affected Employee
Affected employees operate or use the equipment being serviced under a LOTO or they may just work in the area where LOTO services are being performed.

Other Employee
Other employees should not attempt to start, energize or use machines or equipment that is locked and/or tagged out.

Group Lockout Procedure
In some situations, such as when many workers are involved in an activity that requires lockout, using group lockout is possible. Company policy must ensure that LOTO is protected and coordinated through shift changes and throughout all crews working at the site. Procedures must cover lockout only, tagout only, group locks and removal of locks and tags.

General Process for LOTO
The general process for LOTO is:
- Notify all affected personnel that LOTO is to occur.
- Review company drawings and procedures.
- Identify all isolation points and stored energy sources.
- Neutralize by shutting down the equipment and operate isolation devices to isolate equipment.
- Install locks and/or tags. Remove or restrain stored energy.
- Test equipment. Ensure workers are clear of equipment and attempt to start it. Return controls to neutral or off.
Module 3
Fire Safety
Do not become a statistic. Be familiar with emergency response procedures for your location. Respond only to your level of training. Fire safety is defined as the precautions that are taken to:

- Prevent or reduce the likelihood of a fire that may result in death, injury, or property damage
- Alert those in a structure to the presence of a fire in the event one occurs
- Better enable those threatened by a fire to survive
- Reduce the damage caused by a fire

Be familiar with emergency response procedures for your location and respond only to your level of training.

Fire Tetrahedron
In order to understand fire safety, you must first understand fire chemistry. There are four basic elements needed to produce a fire:

- Fuel - paper, wood, rags, oil, grease
- Oxygen - air, ventilation, stored oxygen (greater than 16%)
- Heat - ignition sources, hot surfaces, sparks, open flames, electrical arcs
- Chemical reaction - a self-sustained chemical reaction

To eliminate the potential for a fire or to extinguish a fire, you must remove one or more of the elements.

Prevention
An inspection of the jobsite for fire hazards is important in reducing the possibility of a fire occurring. Identify and remove any unnecessary materials that might serve as fuel and remove potential sources of ignition. There are precautions to be taken for the following situations:

- Static electricity
- Hot work
- Fire watches
- Other fire prevention considerations

Static Electricity
Static electricity is prevalent in strong winds and low humidity, but can be generated anytime liquids or solids are flowed, sprayed, agitated, rubbed or splashed. Sparks generated by static electricity are potential ignition sources. Utilize bonding and grounding procedures to discharge and prevent static charges during transfer of flammable materials from one container to another.

Static electricity can be generated anytime liquids or solids are flowed, sprayed, agitated, rubbed or splashed.

Hot Work
Examples of hot work include welding, flame cutting, grinding or using a torch. Whenever possible, hot work is performed in a designated area. If that is not possible, be prepared to get authorization or a hot work permit to perform hot work operations. Prior to hot work, any hollow space (pipes and confined spaces) should be purged using an inert gas such as N₂ to vent combustibles.
Fire Watch
A fire watch is a designated worker whose responsibility is to make sure the conditions of the permit are enforced and to be prepared to extinguish any fire that may develop. Fire watches must be armed with the appropriate firefighting equipment. They must be on duty whenever hot work is done outside of a designated safe hot work area. Fire watches must remain on duty for at least a half-hour after the completion of hot work operations.

Other Fire Prevention Considerations
Poor housekeeping may allow many objects to accidently be used as fuel to start a fire.
- Always pickup after a job is complete
- Never block fire lanes or access to firefighting equipment and emergency stations
- Do not move or alter such equipment without appropriate permission.
- Respect all smoking restrictions

Combustibles must be properly stored and handled.
- Store combustibles in a locker or other designated area
- Dispose of combustible materials in properly labeled containers; practice good housekeeping

Be alert for defective electrical equipment.
- Use only Underwriter Laboratories® (UL) approved explosion proof equipment when necessary
- Be aware of flammable vapors and locations where they are likely to be present

Fire Detection
Most sites have several types of fire detection devices.
- Heat
- Smoke
- Fire gas
- Flame

Several types of each alarm and detection device are available and may be found in your workplace. Fire detection is used for several reasons. First, it notifies occupants to escape a fire and triggers organized assistance such as a fire team or fire department. Next, it can initiate automatic fire suppression systems. Some detection systems are very sophisticated. These detection systems can supervise fire control systems and initiate various auxiliary functions.

Fire Classification
Fires are classified based on the type of fuel involved. Each class has its own requirements for extinguishment. The fire classes also aid in determining the type of PPE to use when fighting a fire. For purposes of identification, fires have been classified into five categories based on the source of fuel:
- Class A – paper, wood, or trash
- Class B – flammable liquid or gas
- Class C – electrical
- Class D – combustible metal
- Class K – usually grease (kitchen)
**Fire Extinguishment**

Fire extinguishers are classified using the same ABCDK system. To properly extinguish a fire, you must properly match the fire class with the type of extinguisher you are using. Always store fire extinguishers where they are easily accessible, but where they are not likely to fall over or be struck by other objects.

To properly extinguish a fire, you must match the fire class with the appropriate type of extinguisher.

**FIRE EXTINGUISHER CLASSES**

<table>
<thead>
<tr>
<th>Class</th>
<th>Contents</th>
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<td>A</td>
<td>Water</td>
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<tr>
<td>AB</td>
<td>Chemical Foam or Gel</td>
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<tr>
<td>BC</td>
<td>Carbon Dioxide</td>
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<tr>
<td>BC</td>
<td>Dry Chemical</td>
</tr>
<tr>
<td>BC</td>
<td>Liquefied Gas</td>
</tr>
<tr>
<td>ABC</td>
<td>Dry Chemical or Halon Substitute</td>
</tr>
<tr>
<td>K</td>
<td>Sodium or Potassium Bicarbonate</td>
</tr>
</tbody>
</table>

In firefighting, PASS stands for:
- **P**ull the pin
- **A**im the nozzle
- **S**queeze
- **S**weep the base of the fire

Each extinguishing agent operates by attacking one or more of the essential elements of the fire tetrahedron. If the tetrahedron is broken, the resulting reduction in vapor and heat production will put out the fire. Additional cooling with water may be necessary where smoldering or reflash is possible. There are several ways to extinguish a fire:
- Cooling and quenching
- Smothering and blanketing
- Oxygen dilution
- Fuel removal
- Chemical flame inhibition

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**Kitchen Fires**

In the US, the designation Class K was recently assigned to fires that were fueled by cooking utilities or cooking operations, often referred to as grease fires. Fires involving cooking media (grease, fats and oils) in commercial cooking appliances are unlike most other fires because these oils have a wide range of auto-ignition temperatures. Auto-ignition occurs when the oils reach high temperatures, typically above 400°F. At this temperature the oil can spontaneously burst into flames. Once the oil is burning, the entire mass of oil must be cooled below its auto-ignition temperature to be extinguished.

The extinguisher must be discharged onto the fryer with the valve fully open until empty. The heat source to the fryer should be turned off. Never put water on a grease fire. Many commercial kitchens will be supplied with a fixed system fire extinguisher. You should be trained on how and when to operate the system and handheld extinguishers. It is important to recognize when you should fight a fire and when you should evacuate the area and leave fighting to the trained fire fighting staff. Keep the kitchen neat and clean so as to reduce the chance of fire spreading to other materials.
Stop, drop and roll. Do not run. Running fans flames. Drop where you are and cover your face with your hands. Roll until you have smothered the flames. If you see someone on fire, throw a blanket, coat, rug or towel on them as they roll to help smother the flames. If you are on grating, it will be harder to put out the flames because the fire will continue rising through the holes of grating. In this case, alternatives to stop, drop and roll are emergency showers, fire blankets and shouting for help.

Fire Reporting Responsibilities
Basic information about the locations of firefighting equipment and methods of reporting a fire will be available to you during a site specific orientation, during fire drills, and on the station bill or the emergency evacuation plan. Report all fires immediately. Do not attempt to fight fires that have spread beyond the initial stages unless you are trained and equipped to do so. If you do attempt to fight a fire with an extinguisher, make sure that you have a safe exit from the area. Do not get trapped in a room trying to extinguish a fire. Be aware that breathing near a fire can be hazardous. The air will be deficient of oxygen and contaminated by toxic gases.

In any emergency evacuation, remember to shut, but not lock, the doors behind you. Try to shut off electrical appliances and tools (drills, saws, computers, calculators, coffee machines). Most importantly, get away from the danger areas as soon as possible, and inform others of the situation. Every facility should have a station bill or emergency evacuation plan. Information on locations of fire extinguishers, staging areas, and evacuation routes can be found in the emergency evacuation plan or the station bill. Look for it, know the information provided and ask questions if there is something you do not understand. Know who to contact and where to go in advance.

Emergency Response Plans
Hazards are often unique to each facility. The details of emergency response plans and alarm activation systems vary considerably from site to site. This section provides general information on hazards and precautions associated with work at petrochemical facilities and other industrial locations. It is necessary for you to attend a site specific safety orientation at each facility. The site specific orientation will inform you of the hazards and precautions unique to that facility. You must become familiar with the emergency response plan and emergency alarm codes of each facility you visit. Know how to get help, specifically who to call and where call stations are located. Understand the specific emergency actions expected of you.

Evacuation
Evacuation plans are part of the emergency response plan. Know your evacuation or escape routes. Know where your safe areas, assembly points, or muster areas are located and how to reach them. Always check in at the assembly point for accountability. Make it a habit to keep wind direction mind at all times. Smoke or other toxic gases travel in the direction the wind is blowing. Wind direction can be determined by observing windsocks or vapor clouds. Evacuation from offshore sites is more complicated and may require special equipment. If you are downwind of the point of release, travel at right angles to the source and then proceed upwind. If the smoke or other toxic gases are fast moving, you may be advised to shelter in place:
- Don emergency PPE
- Go to the closest safe haven
- Check in for accountability
- Stay there until notified to leave

If you are downwind of the point of release, travel at right angles to the source and then proceed ____________________________.

Role of Contractors
Assist only if you have the proper training. Do not jeopardize your personal safety. If you have special duties, such as activation or shutdown of equipment, complete those actions prior to evacuating. If you are responsible to use special PPE, ensure you have been trained in its use, as well as how to don and doff it.
Mental Emergency Plan
Unless you have been assigned special duties, your primary responsibility is self rescue. Before you begin work in a new area, locate the nearest:

- Emergency exit
- Fire extinguisher
- Eyewash station
- Emergency shower

Incident Response
You need to know how to respond to catastrophic events, as well as minor first aid events. Make a plan for your home, train those in your household and practice the plan.

Process Safety Management
Because of the many potential hazards present at petrochemical facilities, OHSA has adopted a special regulation known as the Process Safety Management (PSM) of Highly Hazardous Chemicals standard. This regulation requires that facilities develop a very detailed plan for assuring safe operation and for dealing with potential hazards. PSM plans contain the following components:

- Employee participation
- Process safety information
- Process hazard analysis
- Operating procedures
- Training
- Contractors
- Pre-startup safety review
- Mechanical integrity
- Hot work permits
- Management of change
- Incident investigation
- Emergency planning and response
- Compliance audits
- Trade secrets

Employers must meet the requirements for each plan component and employees should be consulted for hazard information as well as trained to know and inform employees of hazards that are present in the workplace. Audits are used to verify compliance with the regulation. A representative of the host facility will advise you or your employer of the specific PSM requirements that apply to your work activities during a pre-job meeting.
First Aid and Bloodborne Pathogens

Basic First Aid Response
If there is a medical emergency at your jobsite, remember to only assist at the level of your training. In order to give adequate assistance in a medical emergency you should be first aid and cardiopulmonary resuscitation (CPR) certified. One of the most important things to learn is how to protect yourself first when treating an accident victim. Take the following steps if a medical emergency occurs.

- Notify - sound the alarm
- Assess
- Stabilize
- Transport

Basic First Aid Procedures
The primary procedures to follow in a serious or life threatening first aid incident are:

Notify
If an incident occurs, call 911 or the established emergency numbers. Companies should make sure that there is ready availability of medical workers for advice and consultation. Contact numbers will normally be posted for nearby medical facilities. If there are no medical facilities within close proximity to the workplace, a worker or workers shall be adequately trained to render first aid.

Assess
Assess the scene for hazards prior to stabilizing or performing first aid/cardio pulmonary resuscitation. Assessment of the patient’s condition should also be performed.

Stabilize
If you have training, use it. Do not move someone with possible head or back injury unless it is absolutely necessary to get them to safety. Facilities should be equipped with adequate first aid equipment including a workplace first aid kit meeting the minimum ANSI requirements. If chemicals are present, emergency showers and eyewash stations should be made available. Facilities may have an Automated External Defibrillator (AED). Only workers who are trained in their use should do so. Tourniquets should not be used for control of bleeding because circulation issues that can occur.

Transport
If you are not using an emergency vehicle, contact emergency services in order to tell them your route. This will allow the emergency facility to prepare for the victim’s arrival, and possibly send an emergency vehicle to meet you en route. If the victim has been subject to any hazardous chemicals, include the relevant SDS to assist doctors in treating the patient correctly and more efficiently.

Contact Information
Contact information is normally found in the emergency response plan for the site. You should be able to identify first responders. Trained personnel for first responder/AED use should be listed. A site specific orientation will inform you of notification responsibilities. If in doubt, ask your supervisor. Be familiar with the specific first aid station locations and the site specific first aid procedures that have been established. First aid stations and AEDs normally have signs posted at the location of the equipment.

If you are a first aid provider, the steps you take to provide care are critical to the health and safety of the victim, as well as yours. Protect yourself first when responding to someone who has experienced an accident. As with all accidents, first aid cases must be reported. Even a minor injury must be reported and recorded in the first aid injury log. Never attempt to perform first aid procedures beyond the level of your training.
Bloodborne Pathogens
OSHA has standards designed to protect workers from bloodborne pathogen exposure. Bloodborne pathogens are diseases that are transmitted through body fluids such as blood or saliva.

*Bloodborne pathogens are diseases that are transmitted through body fluids such as ____________ or __________________*.

The most common bloodborne pathogens associated with occupational exposure are:
- Hepatitis B Virus (HBV)
- Hepatitis C Virus (HCV)
- Human Immunodeficiency Virus (HIV)

Universal Precautions
Infected individuals may not show signs of an exposure. Workers should use the universal precaution and assume that all blood and body fluids are potentially infectious.
- Use barrier protection and appropriate PPE
- Wash hands and other skin surfaces immediately if in contact with blood or infectious materials
- Wash hands and other skin surfaces immediately after removing gloves or other PPE
- Avoid accidental injuries when handling potentially contaminated items
- Avoid touching biohazards or contents of red plastic bags.

Bloodborne Pathogens

**Hepatitis B Virus**
HBV is the most common serious liver infection in the world. It is caused by the hepatitis B virus that is transmitted through blood and infected body fluids. Blood infected with HBV can remain infectious for durations up to seven days, which makes it one of the most easily transmitted pathogens though cross contamination. HBV is called a silent infection because most people do not have noticeable symptoms when they are first infected. Many people who do show symptoms will think that they have the flu and ignore the symptoms. A small percentage of infected individuals will develop life threatening symptoms including liver failure. HBV can be fatal if left untreated. Common symptoms of HBV include fever, fatigue, muscle or joint pain, mild nausea and vomiting, severe nausea and vomiting, yellow eyes and skin (Jaundice), or bloated or swollen stomach.

**Hepatitis C Virus**
HCV is a liver disease caused by the hepatitis C virus. The virus is very similar to HBV. Many people who have hepatitis C show no symptoms. HCV is spread in the same manner as HBV through blood to blood contact, unprotected sex, and the use of unsterile needles. Most infected persons develop chronic, long term HCV (carrier) and can spread the infection. Cirrhosis of the liver and liver failure are serious risks associated with this disease, but may take decades to develop. Symptoms may include fever, lack of energy, nausea, vomiting, abdominal discomfort, jaundice.

**Human Immunodeficiency Virus**
HIV is most commonly spread through unprotected sex with an infected partner. HIV can also be spread through contact with infected blood, even though it is rare for an infected person to give HIV to a healthcare worker by accidental sticks with a contaminated needle or other medical instruments. However, very small quantities of the virus can spread the HIV infection. Many infected people are symptom free when first infected with HIV. Others develop a flu like illness within months of exposure. For many, the first sign of infection is the swollen lymph glands. Other symptoms may take years to develop. Symptoms of this flu like illness may include fever, headaches, exhaustion and enlarged lymph nodes.
Material Handling
Cranes, cherry pickers, forklifts, air and hydraulic hoists, and gin pole trucks are common in our industry. Never operate material handling equipment unless you have been trained, certified and authorized. Always be ware of a suspended load. Never position yourself under or between the load and a stationary object. If you are not involved in the operation, stay clear of the load and its path. If you have to work around or are part of the loading operation, always have escape routes. A swinging load is very dangerous. Always make the equipment operator aware of your position. Anticipate the actions of the equipment operator and position yourself accordingly. Pay close attention to alarms.

Never operate a crane or forklift unless you have been ________________, ________________ and ________________.

Forklift Safety
Driving and handling a forklift is very different from driving and handling a car. The weight of the load and the position of the forks changes the center of gravity of the forklift. This makes them very susceptible to tipping over. Every forklift should have a load chart. The forklift operator should use the load chart to properly load the forks. Forklifts have poor forward visibility. In this case, forklifts must be operated in reverse.

Never ride on the load or the forks of a forklift. Stay clear of the load before it is picked up. Listen for the backup horn or warning beeps. Pay attention to where the forklift is heading. Always operate a forklift at a reasonable speed. Forklifts are not go-carts and should not be used for horseplay.

Always wear your seat belt when operating a forklift equipped with a rollover protection device. Carbon monoxide build-up may occur if gasoline or diesel powered forklifts are used in small buildings without proper ventilation. Refuel outside with the engine shut off and brakes set.

When operating in the vicinity of electric overhead lines, assume that all lines are energized. Never bring any conductive object, such as a crane boom or backhoe, within ten feet of unguarded, energized, overhead lines. Electrical arcs and blasts are a potential danger in any electrical device. Arcing can cause the energizing of equipment, even when it is not actually touching the energy source.

When operating in the vicinity of electric overhead lines, assume that all lines are ________________.
Crane Safety
Prior to operating a crane, crane operators must conduct visual checks and immediately report any defects. Any part of a crane not fit for service must be taken out of service.

Basic Rules for Crane Operation
- Do not leave the controls during a lift.
- If a load is considered unsafe for lifting, crane operators should refuse to lift the load.
- Crane operators must designate a qualified signal person.
- Do not ride on suspended loads or hooks.
- Obey any emergency stop signal.
- Assume overhead electrical lines are energized.
- Know and use proper hand signals.

Rigging and Tagline Safety
A tagline is a rope attached to the load to offer the rigger control of the load without putting them in a position that they may be injured. If a rigger did not have a tagline to control a load they would practically be underneath the load trying to land it. In order for the taglines to give the rigger suitable protection there are some requirements that should be followed. They include:
- Attach taglines before load is lifted
- Use taglines to position the load
- Taglines must be strong enough for safety of riggers
- Taglines should be strong, clean and free of knots.
- Watch for pinch points/entrapment
- Never wrap taglines around body parts

Riggers must know the safe working load (SWL) of sling chains, wire rope, and other lifting apparatuses so riggers do not overload them. Riggers must be trained to know and use proper hand signals at all times.
HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.

LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circle.

USE MAIN HOIST. Tap fist on head; then use regular signals.

USE WHIPLINE (Auxiliary Hoist). Tap elbow with one hand; then use regular signals.

RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.

LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.

MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)

RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.
SWING. Arm extended, point with finger in direction of swing of boom.

STOP. Arm extended, palm down, move arm back and forth horizontally.

EMERGENCY STOP. Both arms extended, palms down, move arms back and forth horizontally.

TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.

DOG EVERYTHING. Clasp hands in front of body.

TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward. (For land cranes only.)

TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For land cranes only.)

EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.

RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.
Hand Tools
Use the proper tool for the job. Always wear the correct PPE. Inspect hand tools prior to use. Do not use broken or damaged tools. Do not attempt to make your own tools.

Power Tools
Where potentially explosive atmospheres may exist, use explosion proof and non-sparking tools, equipment and extension cords. Use properly insulated and grounded tools. Do not alter or modify them. Never remove or modify a safety device or guard. Use proper body position to maintain adequate control of the tool.

Taglines
- When taglines are not practical, avoid placing any part of your body between the load and walls, docks, pallets, or other objects that may trap or crush you.
- Hook openings must be turned outward on hook slings.
- Knots or kinks are not permitted in wire rope.
- Rigging with excessive wear should not be used.
- Attach before the load is lifted.
- Should be long enough to allow free movement of the worker holding the line. No part of the person guiding the load should be under the load at any time.
- Non-conducting taglines should be used to control all suspended loads. Chains or steel cables are not acceptable.
Non-powered Tools
Do not use your hands as tools. Only use tools for the job that they were designed for. Do not use knives as screwdrivers or pry bars. Use tools that are properly sized for the job. Never cut toward your body with a blade or sharp or pointed object. Do not store blades or knives with other tools. Use proper body position to maintain control of the tool.

Never cut ___________________________ your body with a blade or sharp or pointed object.

Simple Hand Tools
Using the wrong tool for the job, using the right tool in the wrong way, or using an unsafe or broken or dull tool can result in serious hand injury. Choose the right tool for the job.

- Wrenches
- Screwdrivers
- Knives

Elevated Work
Do not carry hand tools when climbing. Secure any hand tools used at an elevated work location with a safety line.

Do not carry hand tools when ____________________________________.

Cheater Bar/ Pipe Safety
The use of a cheater bar/pipe is not recommended. They are only to be used as a last resort to break a connection when wrenches have failed the job. Some jobsites do not allow their use. Ask your supervisor before using a cheater bar. If permitted, use it carefully. Longer cheater bars can damage the wrench or handle. They should not exceed twice the length of the wrench or handle to which they are applied.
Walking Working Surfaces
Good safety housekeeping is very important and basic to having a safe and productive work place. Good housekeeping should be practiced in work areas and non-work areas alike. Work areas, passageways, storerooms, and service rooms should be kept clean and orderly and in a sanitary condition, with aisles and passages kept clear and free of obstructions. Never block permanent aisles and passageways as this may block emergency exits and if protruding objects are present, they must be flagged. Poor housekeeping is the cause of slips, trips, and falls, which account for most accidents on the job. The best way to improve housekeeping is to put things in their place when you complete a job, clean up spills immediately, and to properly handle clutter, debris, waste and obstructions that may cause you or someone else to have an accident.

Poor housekeeping is the cause of slips, trips, and falls, which account for most accidents on the job.

Slips, Trips and Falls
According to the BLS, 13% of fatal injuries came as a result of falls. It is very important to prevent slips, trips, and falls by taking proactive measures to eliminate their causes. Slips, trips, and falls are often a result of:
- Unstable work surfaces
- Improper placement of ladders
- Poor housekeeping
- Carrying materials that block vision/line of sight
- Lacking a well-defined heel when climbing ladders
- Improper use of fall protection

Following your company's procedures for proper housekeeping, fall protection, and general worker awareness will help prevent or eliminate these hazards. Responsibility for worker safety is the primary concern on the job.

Ladders
Ladders are primarily designed to provide access to elevated areas. They are not to be used as work platforms unless the job can be performed using only one hand and the worker's belt buckle never extends past the side rail of the ladder.

Ladders are primarily designed to provide access to elevated areas.

Two types of ladders are commonly found in industrial facilities are portable ladders and fixed ladders. There are certain safety precautions that must be followed. These include getting authorization from a supervisor to perform elevated work, wearing appropriate PPE, properly securing tools and equipment so that both hands are free, using fall protection, and having emergency evacuation PPE.

Portable Ladders
Before using a portable ladder, select the appropriate ladder for the job. It may be a self-supporting step ladder or non-supporting extension ladder. Always inspect a ladder before use. Inspect the footing, rungs or steps, side rails, hinges, and spreaders. Tag damaged ladders immediately and notify a supervisor. The damaged ladder must be taken out of service until it is repaired.
Extension ladders are most commonly used to transit to higher levels where permanent access is not provided. They require special safety precautions which include:

- Clear the work area
- Firm level footing
- Extend 3 feet past upper landing
- Sturdy upper support
- Slope 4:1
- Assistant to stabilize ladder
- Tie off the ladder to prevent slippage
- Do not overreach
- One person at a time on the ladder

**Fixed Ladders**

Fixed ladders are provided in frequently accessed, elevated areas. OSHA requires that fixed ladders higher than 20 feet are equipped with fall protection cages or other protective devices with rest platforms every 30 feet. Before you climb, perform a visual inspection of fixed ladders. If you feel a fixed ladder is unsafe, attach a warning tag and immediately report the problem to your supervisor.

If you feel a fixed ladder is unsafe, attach a warning tag and immediately ____________________________ the problem to your supervisor.

**Job-made Ladders**

Job-made ladders are created at the jobsite for a specific job. All job-made ladders must conform to OSHA specifications. Ask your supervisor for the specification prior to building the ladder and have a supervisor inspect for proper construction prior to use.

**Scaffolds**

Scaffolds are primarily designed as work platforms. They allow workers to perform jobs that take a long time, require both hands, or require more than one person.

______________ are primarily designed as work platforms.

**Scaffold Components**

A scaffold must be properly designed and assembled by qualified personnel. Since scaffolds are engineered systems, components from different scaffolding systems must not be intermixed. Barrels, boxes, loose brick, and concrete blocks must not be used to construct scaffolding foundations. Risers and braces must be securely fastened with the locking mechanism properly engaged. Diagonal cross braces must be provided according to design specifications.
Ladders or stairways must be provided for climbing onto scaffolds. Always use a ladder or stairs to access the upper work surface of a scaffold. Never climb or work from the handrail, guardrail, midrail, cross braces or braces of the scaffold system. Keep hands free when using stairs. Use handrails on stairs. Guardrails and toeboards are required when scaffolding is greater than 10 feet in height. Handrails must be on all open ends and sides of the platform. The platform must also have top rails and mid rail handrails. In addition, a fall arrest system must be used. Remember the tie-off point cannot be part of the scaffold. Toeboards must be at least 4 inches high. They are installed to prevent kicking loose objects off the platform.

**Ladders or stairways must be provided for climbing onto_____________________.**

**Securing a Scaffold**
If a scaffold is secured to a structure, it must be tied to the structure every 30 feet horizontally and every 26 feet vertically. The structure must be capable of supporting the load of a scaffold. If the structure cannot support a scaffold load, it may need guying and a competent engineer must create the design.

Scaffold planking must be of scaffold grade material and must cover the entire working platform to form a continuous, smooth working surface. If the planking is wooden, it must extend 6-18 inches past the end of the scaffold. If the planking is metal, it must not extend past the end supports. Gaps between planks must be small enough to prevent tools and materials from falling through.

**Height Restrictions**
The height of freestanding scaffolds is limited to four times the smallest dimension of the base. Very tall scaffolds require special precautions. Registered professional engineers must design scaffold that is:
- Greater than 125 feet in height for fabricated or tube and coupler scaffold
- Greater than 60 feet for pole scaffolds
- Any scaffold capable of being moved with people on them

**Tagging System**
Although OSHA does not require it, many operators and companies use scaffold tagging systems to indicate the working conditions of scaffolds. The most common system includes red, yellow, and green tags which mean the following:
- Red - Do not work on scaffold
- Yellow - Work can be performed (within the handrails on scaffolds) with additional fall protection
- Green - Work can be performed (within the handrails on scaffolds) without additional fall protection

**Inspection**
Only qualified personnel can inspect a scaffold for visible defects, such as general damage, deterioration and loose parts. A scaffold must be inspected before each work shift and after any occurrence that could affect the structural integrity of the scaffold.

**Stairways and Handrails**
Stairways serve much the same purpose as ladders except they are composed of steps, landings, risers and handrails. At least one handrail is required on stairways with four or more risers or a rise greater than 36 inches. Handrail requirements also depend on the stairway width and must provide adequate handhold. Handrails must be able to withstand at least 200 pounds of weight.

General safety rules for stairways include:
- Always use handrails
- Keep stairways clear of objects
- Avoid carrying vision blocking loads
- Be alert to wet or slippery surfaces
- Report damaged stairways immediately

**Floor or Wall Openings and Holes**
Requirements vary based on the opening or hole type. In general, they must either have a standard rail, be covered or be constantly attended. Specific requirements vary based on the opening.
Floor or Wall Openings and Holes
Manholes, open hatches, loose gratings, platforms with open sides, and other miscellaneous floor and wall openings create hazards. Place guards or barriers around openings if they are not covered. Every floor hole must be guarded by either a railing with a toeboard, or a cover of standard strength and construction. If the cover is removed, the floor hole must be constantly attended or protected by a removable standard railing. These fall hazards are dangerous to those working below and to those falling from above.

Floor or wall openings and holes with a drop of greater than four feet must be guarded by:
- Rail
- Roller
- Picket fence
- Half door
- The equivalent of any of these

Guardrails, Handrails and Barricades
Guardrails, handrails, and barricades, including safety chains and cables, may mark temporary barriers where a hazardous condition exists. Be aware of such guards and barricades. They may indicate a drop of more than four feet or that fall protection may be necessary due to a dangerous situation.

Working at Heights
Falling from heights is a common cause of injury and death. OSHA has requirements for working at heights that can be found in both the general and construction portions of their regulations. As with other work activities, you should only work to your level of training.

Fall Protection
In order to protect against falls, workers must use a fall protection system anytime they are in an unguarded area with a potential for a fall of six feet in construction and four feet or more in general industry. Fall protection is required if:
- At height limits above the working surface
- Above an area of immediate danger
- Working on a tank roof (some exceptions)
- Lifted or lowered by air hoist or hydraulic winch (except when in a personnel basket for offshore transfer)
- The facility requires it

Fall arrest equipment is used when workers are working in exposed areas where they may be subject to a fall. All parts of a fall arrest system must be capable of supporting a 5,000 pound load. A fall arrest system typically consists of a full body harness, a lanyard, a fall brake, and a tie-off point.

A fall arrest system typically consists of a ________________________________ harness, a lanyard, a fall brake, and a tie-off point.

Full Body Harness
A full body harness minimizes injuries from fall by maintaining the body in a vertical position and distributing the forces of the fall across the body. To be effective, a full body harness must be worn properly, inspected monthly or quarterly, and visually inspected prior to use. The harnesses must show no evidence of defects, damage, or modifications. If the harness is subjected to the stress of a fall, it must be destroyed and disposed of. The harness must be worn as described in the manufacturer's instructions.

Safety Belt
Safety belts are positioning devices, not fall arrest equipment. They are supposed to be worn underneath the ribs, not on the waist. Falls in safety belts can result in serious internal injuries to soft organs, such as the abdomen. Safety belts are not allowed in most facilities.
Lanyard
A lanyard is a device that connects the anchor to the harness. The length of a lanyard varies depending upon the location of the tie-off point. Lanyards must restrict a fall to six feet or less. A lanyard must be designed for use in a fall arrest system. Improvised lanyards made from cable or ropes found on the jobsite are not acceptable. Lanyard attachment hardware must be a double locking design. Attach the lanyard to the back of the full body harness. This allows the body to fly forward during a fall and reduces the possibility of internal injuries. You may need a device called a softener to prevent chaffing of a lanyard.

Fall Brake
Fall brakes or deceleration devices are provided to control deceleration during the fall. A deceleration device limits the gravitational force exerted on the person falling, reducing the severity of injuries.

Tie-off Point
A tie-off point provides anchorage for the fall arrest system. 80% of all errors in fall protection are related to improper selection of the tie-off point. A tie-off point should be located as directly above and behind the worker as possible to minimize pendulum swings that could cause injury. A tie-off point must be able to handle a 5,000 pound load. Hand railings, process piping and cable trays are not adequate tie-off points unless approved by a supervisor.

The tie-off point must be able to handle a ________________ pound load.

Other Fall Protection
Other types of fall protection are:
- Static lines
- Climbing lines and counterweights/ladder climbing devices
- Ladder climbing devices
- Double lanyards – lanyards should never be shortened by tying knots in them; this can weaken them by 50%
- Guardrails, safety chains, cables, barricades, handrails
- Safety nets
- Retractable lifeline (retractable, inertial braking mechanisms/inertia reel) – may be used with a full body harness in certain situations and are usually made of metal cable

Pay attention to the types of chemicals being used in the work area. Some lanyards and other equipment may deteriorate in certain situations. Use only approved cleaning agents for all fall protection equipment. Inspect all equipment regularly and before each use. Remove from use and replace or repair any damaged equipment, or equipment that has been involved in a fall, even if it shows no evidence of damage.

Employee Responsibilities
Employee responsibilities for fall protection include:
- Do not work at heights unless trained
- Know the hazards of working at heights
- Inspect fall arrest PPE prior to use
- Wear a fall arrest system when required
- Be alert for fall hazards
- Be aware that some chemicals can damage your fall arrest system
- Use only approved cleaning agents on fall protection equipment
- Use toeboards, barricades, canopies, hard hats and use lines to secure tools and materials
Inspection
All components must be inspected prior to use. Your body harness must not show any evidence of defects, damage or modification. If your body harness has been subjected to a fall, it must be taken out of service.

Equipment for Working at Heights
If lifting personnel by air hoist or hydraulic winch the lifting device must be approved for lifting personnel. During the lift, the operator cannot leave the controls and cannot lift a load on the same line as people. All components of the lift system must be inspected prior to use.

Powered platforms are often used for building maintenance. Powered platforms are permanently dedicated to interior or exterior building maintenance. Vehicle mounted platforms encompass any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel. A manlift is a device consisting of a power-driven endless belt moving in one direction only.

Confined Spaces
Confined Space Identification
Confined spaces can be non-permit required or permit required based in the presence of a known hazard. A confined space is considered to be large enough to physically enter, has limited or restricted entry or exit, and was not designed for continuous human occupancy. Confined spaces may include underground vaults, tanks, storage bins, manholes, pits, silos, process vessels and pipelines. Entry into a confined space is usually done to perform a necessary function, such as inspections, maintenance, or repairs. It is important for workers to understand the types of spaces, hazards, exposure symptoms, testing procedures and emergency rescue procedures when working in these areas.

Permit Required Confined Spaces
OSHA uses the term permit required confined space, or permit space, to describe those spaces meeting the definition of confined space and contains or has a potential to contain a hazardous atmosphere, contains a material that has the potential for engulfing an entrant, has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section or contains any other recognized serious safety or health hazard.

To help identify these areas as permit required confined spaces, the company must post signs. This will help to keep unauthorized workers out of these spaces. If you think an area is a confined space, but no sign is posted, do not enter the area until you have discussed the situation with your supervisor. Almost all confined spaces encountered in the petrochemical industry will be permit required.
Confined Space Hazards
The safety hazard in a permit required confined space may be any potential hazard. The hazards can be atmospheric or physical.

Atmospheric hazards may include:
- Oxygen enrichment (greater than 23.5%)
- Oxygen deficiency (less than 19.5%)
- Toxic gas or vapor
- Flammable gas or vapor

Physical hazards may include:
- Engulfment/entrapment
- Asphyxiation
- Falls from heights
- Converging walls
- Downward sloping floors
- Unguarded machinery
- Materials that create slip, trip, or fall hazards
- Falling materials
- Hazardous residual chemicals
- Standing water (drowning)
- Electrical
- Temperature
- High noise levels
- Vibration

OSHA Requirements
Companies must develop a written permit space entry program detailing the overall safety program in place for dealing with confined spaces. Your company must develop and coordinate this program with all other involved parties, such as contractors, so that all changes, including crew and shift changes, are addressed. All potential hazards must be taken into consideration for each confined space.

Entry Permit
Before any work begins in a permit space, a standardized permit must be obtained. Even though confined space entry permits may look different for each company, they will serve the same purpose. An entry permit is required prior to any entry, and must be posted at the primary entrance. It must be reissued by the designated supervisor at the beginning of every shift or if conditions in the confined space change. The permit is normally issued by the host designated supervisor. Employee training and a rescue plan must be in place before a confined space permit is issued.
# Confined Space Entry Permit

**Location of Confined Space and Purpose of Entry:**

<table>
<thead>
<tr>
<th>Atmospheric Hazards:</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen Deficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxic</td>
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</tbody>
</table>

**Physical Hazards:**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engulfment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Date:**

**Duration:**

**Expires On:**

**Emergency Contact #:**

## Pre-Entry Check List

<table>
<thead>
<tr>
<th>Yes</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
<td>Entry area is free of debris and objects</td>
<td></td>
</tr>
<tr>
<td>Warning barriers and signs are in place</td>
<td></td>
</tr>
<tr>
<td>Atmospheric monitoring conducted</td>
<td></td>
</tr>
<tr>
<td>All hazardous lines have been isolated</td>
<td></td>
</tr>
<tr>
<td>Hot work permitted (welding, cutting, grinding, etc.)</td>
<td></td>
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<tr>
<td>All energy sources have been neutralized/locked out</td>
<td></td>
</tr>
<tr>
<td>The confined space has been drained and flushed</td>
<td></td>
</tr>
<tr>
<td>Forced air or exhaust ventilation is provided</td>
<td></td>
</tr>
<tr>
<td>Electrical equipment is grounded</td>
<td></td>
</tr>
<tr>
<td>Ground fault circuit interrupters (GFCI) provided</td>
<td></td>
</tr>
</tbody>
</table>

## Atmospheric Checks

**Tests Required**

<table>
<thead>
<tr>
<th>Oxygen</th>
<th>Yes</th>
<th>No</th>
<th>Acceptable Entry Conditions</th>
<th>Measurement and Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustible Gas</td>
<td></td>
<td></td>
<td>TEL-TWA STEL OTHER</td>
<td></td>
</tr>
</tbody>
</table>

**Combustible Gas:**

- Below 10% LEL

**Carbon Monoxide:**

- 0-25 ppm 0-25 ppm

**Hydrogen Sulfide:**

- 0-10 ppm 0-15 ppm

## Protective Equipment

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Hat</td>
<td></td>
</tr>
<tr>
<td>Eye/face protection</td>
<td></td>
</tr>
<tr>
<td>Boots</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protecting Clothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Protection</td>
</tr>
<tr>
<td>Retrieval Device</td>
</tr>
<tr>
<td>Harness and Lifeline</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respirator (Type)__________</td>
</tr>
<tr>
<td>Fire Extinguisher (Type)____</td>
</tr>
<tr>
<td>Other (Type)__________</td>
</tr>
</tbody>
</table>

## Approvals

I certify that all necessary precautions have been taken to make this confined space safe for entering and conducting on the prescribed work during the prescribed time(s) as well as emergency response procedures.

Entry Supervisor’s Signature: ____________________________

Date: ____________________________

<table>
<thead>
<tr>
<th>Print Name</th>
<th>Initial</th>
<th>Date</th>
</tr>
</thead>
</table>

Permit Prepared By: ____________________________

Atmosphere Tester: ____________________________

Attendant: ____________________________

Response Team Leader: ____________________________

I have been properly instructed for safe entry into this confined space and understand my duties.

Signature of Entrant(s): ____________________________

I.D. No.: ____________________________

Date: ____________________________

Signature of Entrant(s): ____________________________

I.D. No.: ____________________________

Date: ____________________________
Confined Space Training
All workers involved in confined space entry must be appropriately trained. Training should take place before workers are assigned to confined space work, when there are new hazards, if changes occur, or whenever the company believes that there are deviations in worker competency. OSHA identifies four main levels of training:

- Entrant
- Attendant
- Supervisor
- Rescuer/Rescue team

The entrant must be trained in confined space entry and be identified on the permit. The entrant must be aware of the hazards within the confined space and must wear appropriate PPE. While in the confined space, the entrant must stay in communication with the attendant and alert the attendant to any dangerous conditions. If hazards or conditions change, the entrant must immediately evacuate the confined space.

The attendant must be aware of the hazards and conditions that exist in the confined space. The attendant must be aware of how exposure to those hazards can affect behavior to be able to detect problems with entrants. The attendant accurately maintains a count of entrants and keeps the tracking system up-to-date. The attendant cannot leave the confined space entrance unless relieved by another attendant and must be in communication with the entrants. With the help of the entrants, the attendant monitors external and internal conditions and orders evacuation of the confined space if necessary. If needed, the attendant will call for the rescue team. Attendants may perform rescue only if they are trained in rescue operations and have been properly relieved by another attendant.

The confined space supervisor determines if conditions are acceptable and authorizes entry into the confined space. The supervisor provides oversight of entry operations and the supervisor can terminate the entry if necessary.

The rescuer or rescue team is trained in confined space rescue. All members are identified on the entry permit and in the rescue plan. It is important for the rescue team to know and understand the hazards present in the confined space. Rescuers must be trained as entrant and attendant and receive additional training:

- Understand and use PPE required to perform safe rescues
- Use specialized rescue equipment and techniques to perform rescues
- Provide basic first aid and CPR
- Rescue teams must conduct annual drills
- Respond to an emergency in a timely manner

Rescue
Studies show that more than half of those killed in confined spaces are rescuers. Rescue operations must only be performed by rescuers who are properly trained and equipped. Attendants and non-permitted personnel should never enter a confined space to perform rescue unless they are also trained rescuers with the proper equipment and have backup. In some cases as many as four would be rescuers were killed attempting to rescue a downed coworker. Never attempt a rescue by entering into the confined space unless you are a trained rescuer, otherwise there is a high probability you will become the next victim.

Studies show that more than half of those killed in confined spaces are _______________________.

Confined Space Rescue
When appropriate, authorized entrants who enter a permit space must wear a chest or full body harness (wristlets may sometimes be used) with a retrieval line/life line attached to the center of their backs near shoulder level, or above their heads. The other end of the retrieval line is attached to a mechanical device or to a fixed point outside the permit space. A mechanical device must be available to retrieve personnel from vertical type permit spaces more than five feet deep.
Electrical Safety
The OSHA standard on electrical safety includes work performed work on or near exposed energized parts of equipment, the proper use of electrical protective equipment and the safe use of portable electric equipment and accessories. OSHA requires that equipment normally be de-energized prior to performing work unless it is not feasible or if de-energizing the equipment would actually introduce or increase hazards.

Electrical Hazards
The dangers of electrical work are widely known. Normal mains voltage, as much 240 volts AC, can cause shock, burns or death. Sparks from static or equipment can cause fires and explosions. Faults in lines or equipment can set off fires and explosions or cause shock.

- Wet and damp surroundings
- Outdoors – weather conditions and the possibility of long extensions create more hazards
- Cramped spaces, especially in confined spaces, where a metal shell may make it difficult to avoid shock in the case of malfunctioning equipment
- Hazardous atmospheres – a small spark (from static or equipment) can cause explosions/fires in flammable or corrosive atmospheres
- Live electric lines and equipment may arc and, of course, can be dangerous to touch
- Equipment wear – extension cords and power tool electrical cords are prone to damage (tears in cord, broken prongs, etc.) which may make them a higher risk

Gases, Vapors and Electrical Equipment
In order to reduce the possibility that electrical energy will provide a source of ignition, equipment must meet certain design specifications established in the National Electrical Code. Equipment is marked as follows:
- Class I - Equipment designed for use in areas where flammable gases or vapors may be present
  - Division 1 - Designed for use in areas where flammable gases or vapors are frequently present
  - Division 2 - Designed for use in areas where flammable gases or vapors are occasionally present

API RP 500 provides guidelines for determining the degree and extent of Class I, Division 1 and Class I, Division 2 locations for the selection and installation of electrical equipment at petroleum facilities.

Because of the controls on electrical equipment in classified areas, engineering controls were implemented for Class I areas. Two of these are the use of intrinsically safe and explosion proof equipment. Intrinsically safe devices do not contain enough energy to create an arc strong enough to cause a fire or explosion. Explosion proof devices are constructed such that even though combustible mixtures may collect inside the device and explode, the explosion will be fully contained within the device.

Sometimes it is best to avoid using electrical equipment. In these cases alternative energy, such as hydraulic, pneumatic or hand powered equipment, can be used. Make sure that the equipment is appropriate for the area you are working in. If you don't know, ask your supervisor.

Electrical accidents are caused by working with unsafe equipment and installations, working in unsafe environments and using unsafe work practices. You can control all of these. The best person to protect you is you.
Unsafe Work Practices
Examples of unsafe work practices include:
- Failure to utilize proper lockout/tagout
- Unauthorized work on energized circuits
- No electrical protective equipment
- Use of materials or tools too close to energized circuits
- Unsafe working position
- Use of defective equipment
- Blindly reaching into or near energized circuits
- Not using a ground fault circuit interrupter (GFCI)

Unsafe work practices include ________________ work on energized circuits.

Energized Versus De-energized
Energized equipment means those exposed, live parts of circuits, that may be directly contacted, or contacted by tools or materials. Energized equipment has the power on.

Energized equipment has the power ________________.

De-energized equipment means those parts of circuits that have been disconnected from all their power sources and present less of an electrical hazard, for example lockout/tagout has been applied. De-energized equipment has the power off.

De-energized equipment has the power ________________.

Working Near Exposed De-energized Components
Remember that if equipment is not locked out or tagged out or both, the equipment is considered energized. To de-energize equipment, you must have a safe procedure to follow. The procedure should guide you in disconnecting the equipment from all electrical sources and discharging all stored energy. Stored non-electrical energy, such as springs, must be blocked or released to prevent actuation.

Working Near Exposed Energized Components
Work on energized equipment should be done as a last resort and only be qualified personnel. Before work begins, install protective shields, barriers or insulating materials as required. Use insulated tools if they might contact energized parts and ensure adequate PPE is used for the job.

Overhead Line Safety
Overhead lines should be de-energized whenever possible. Until proven otherwise, all overhead lines should be assumed to be energized. Always maintain the required distance from active lines. Unqualified personnel and any conductive object they might touch must stay at least 10 feet away from lines that are 50 kilovolts (kV) or less. Only a qualified person may get closer to the lines. Any vehicle or other equipment must maintain 10 feet or greater clearance if any structural part can be near the lines if the line voltage is 50 kV or less. If a vehicle has an elevated structure, such as a boom, personnel on the ground should not touch the equipment and if the equipment is intentionally grounded, personnel should stand clear of the ground connection. Remember that equipment does not need to be directly contacting the line to become energized. Arcing can energize both the equipment and the load if too close to an energized line.

Unqualified personnel and any conductive object they might touch must stay at least ________________ away from lines that are 50 kilovolts (kV) or less.
Portable Electrical Equipment
When using portable electrical equipment, never raise or lower it by the cord as this can damage stress reliefs and eventually the insulation. If the equipment you are using is not double insulated, ensure the cord plug has a ground prong. Do not use any electrical cord with exposed wiring. If working in a classified area, ensure you are using equipment that is approved for use in that area.

When working with extension cords:
- Ensure it has ground connections on the plug ends
- Ensure the ground prong has not been removed
- Always inspect an extension cord prior to use
- Avoid long extension cords
- Always use approved couplers if connecting extension cords
- Immediately replace damaged extension cords

Ground Fault Circuit Interrupters
One of the best ways to protect against electrical injury is by using a ground fault circuit interrupter (GFCI). GFCIs are designed to interrupt a circuit as soon as they sense a small amount of current leakage to ground. GFCIs protect people, not equipment. They should be periodically tested for proper operation by depressing the test button to verify the circuit de-energizes and then depressing the reset button to re-energize the circuit. If the GFCI trips while you are working, notify your supervisor because this may indicate there is a serious problem with the electrical equipment you are using. Anytime an extension cord is added to a circuit, even if a GFCI breaker or receptacle already protects the circuit, a GFCI must be installed between the extension cord and the equipment it is supplying.

Ground Fault Circuit Interrupters

Electrical Protection
There are a number of ways to protect yourself from becoming part of an electrical circuit. Make sure you follow the LOTO rules of your employer and those of the host facility without exception. Lockout is the preferred method for protecting employees working with or near potentially dangerous equipment, although tagout is allowed if locking out is not possible.

Electrical equipment such as welding leads, extension cords and metal cased tools should be periodically inspected as part of the assured grounding program as well as before each use. An assured grounding program, which includes regular, documented inspections provides verification that equipment and circuits are properly grounded and will help protect you.

Wet work areas should be avoided if working with electrical equipment. Wait until the area is dry or use wet environment tools. Alternative powered tools are also a consideration. Double insulated tools are completely electrically isolated to offer protection from contact with electricity. A ground prong is not necessary due to the inherent electrical isolation.

Emergency Shut-off Switch
Emergency shut-off switches are normally located near major electrical equipment. You should know the location of any emergency shut-off switches. It could allow you to save the equipment or a life, if something goes wrong.

Avoiding Other Hazards
Never take chances with electrical equipment. If you suspect it is damaged, take it out of service and have it repaired or replaced. OSHA has special testing requirements for electrical PPE. You cannot look at electrical PPE and determine if it is safe to use. It must be tested. Electrical PPE includes gloves, matting, blankets, covers, line hoses, and sleeves.
Welding cable should be treated as any other conductor. It should be inspected prior to use and cannot have splices within 10 feet of the rod holder; damaged cable should be repaired or replaced immediately. Always connect cables with appropriate connectors and lastly, do not wrap welding cables around any part of your body.

Be aware of other electrical safety hazards on the job. If a fellow worker does sustain an electrical injury, it is very important that the circuit be de-energized before attempting a rescue. After rescue, seek immediate medical attention for the victim. Electrical arcs can energize equipment without touching it.

Bonding and grounding is a technique that is used to equalize the electrical potential between equipment. It is most frequently used to prevent sparks during the transfer of flammable liquids. Static electricity sometimes develops as fluids flow between containers. If a conductor is fastened to each container and one of the containers is connected to ground before the transfer starts, the possibility of sparking is reduced. The conductor is normally fastened to the full container first and the empty container second. It is not usually possible to bond plastic containers.

**Excavation Hazards**

Excavation is one of the most hazardous construction activities. OSHA requirements normally only apply to excavations deeper than four feet.

Cave-ins cause the most deaths in excavations. Victims die from asphyxiation caused by the weight of the collapsed material preventing the chest from expanding. Even if the victim’s airway is open and oxygen is available, the constriction of the chest cavity prevents gas exchange from taking place in the lungs. Trenching accidents cause an estimated 100 deaths per year and account for about 1% of work related deaths in the US.

Causes the most deaths in excavations.

Hazardous atmospheres are sometimes encountered in excavations. This is a particular problem when the excavation is in soil saturated with hazardous liquids. The presences of gases or vapors that are heavier than air greatly enhance the danger.

Underground utilities, such as pipelines and electrical cables, are a potential hazard during excavations. Before ground is broken, call 811 which is a national number that engages utilities. Utility lines will be marked free of charge to prevent contact with them.

Underground utilities, such as pipelines and electrical cables, are a potential during excavations.

The markings are:

- Red - Electric
- Orange - Communications, telephone/CATV
- Blue - Potable water
- Green - Sewer/drainage
- Yellow - Gas/petroleum pipeline
- Purple - Reclaimed water
- White - Premark site of intended excavation

A meeting should also be held with plant maintenance personnel so that internal underground utilities can be located. If red cement or a warning tape is encountered while excavating, excavation should stop until additional information can be obtained.
Training and Competency
You must be trained prior to working in an excavation. Training should include access and egress, protection from water accumulation and stability of structures. You can be trained at two levels, employee worker and competent person. Only registered professional engineers can determine if adjacent walls and structures are stable and that an excavation is safe for employees to enter.

You must be ________________ prior to working in an excavation.

Safe Work Practices and Procedures
One of the worst things that can happen when workers are in the excavation is to have materials, equipment or personnel fall on them from above. Barricades protect the workers above and below the ground.

If an emergency does take place in the excavation, the chance of a worker being severely injured or killed can be reduced if simple steps are taken in advance. OSHA requires that a means of exit, such as a ladder or ramp, must be positioned within 25 feet in excavations deeper than four feet. A rescue plan should also be developed which includes the pre-positioning of rescue equipment. Both of these steps will allow a speedy response in the event of a cave-in. All workers, including rescuers, should avoid entry into the excavation until it is stabilized.

All workers, including rescuers, should avoid entry into the excavation until it is ________________.

OSHA requires precautions to be taken to prevent cave-ins in excavation deeper than four feet. Two general methods have been developed to prevent cave-ins. One method is shielding and shoring; this method relies on mechanical structures to support the sides of the excavation. The other method is sloping and benching. This method is based on the soil type and relies on angling the face of the excavation so that the walls will safely support themselves.
Inspections
Inspections should be performed:
- Prior to start of work
- As needed throughout shift
- Daily
- After rainstorms
- Other hazard changes
- When employee exposure can be reasonably expected

Use of PPE
When working in deep or confined footing excavations you must wear a full body harness with a securely attached lifeline. The lifeline must be separate from the materials handling lines and must be individually attended while you are in the excavation. You must have adequate respiratory equipment for the atmosphere in the excavation.

Hazardous Atmospheres
If the excavation if greater than four feet in depth, you must test the atmosphere prior to entry. If flammable gases are greater than 20% lower explosive limit (LEL) then your exposure must be prevented and the excavation must be ventilated and retested prior to entry. Always take precautionary measures and ensure adequate ventilation and appropriate respiratory equipment is used. H2S is another atmospheric hazard you may find in an excavation.

Emergency Response Plans
Emergency response plans vary from location to location, so you must be aware of what is required at your worksite. The plans contain notification information such as the responsible person and provide phone numbers. The emergency response plan provides guidance on expected actions. Know your responsibilities.

Soil Types
In sloping and benching, the angle necessary for safe excavation is determined by the type of material being excavated:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Description</th>
<th>Angle Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Rock</td>
<td>solid mineral material</td>
<td>90°</td>
</tr>
<tr>
<td>Type A</td>
<td>clay, sandy clay, and clay loam</td>
<td>53°</td>
</tr>
<tr>
<td>Type B</td>
<td>angular gravel, silt, sandy loam, and previously disturbed soil</td>
<td>45°</td>
</tr>
<tr>
<td>Type C</td>
<td>gravel, sand, loamy sand, and soil freely seeping water</td>
<td>34°</td>
</tr>
</tbody>
</table>

*If the soil type is unknown, assume it is Type C.
Offshore Module
Offshore Lifestyle
Preparation is the key to a safe and successful stay offshore. Plan ahead for your trip and do an inventory of the items you use on a daily basis. This should include your PEC photo ID card. Plan for a longer stay than scheduled, whether it is for a day or two, a 14 day hitch, or longer. It is advisable to always have your PEC photo ID card with you when heading offshore. Your host company will recognize the card. It gives them your basic identification information and shows your level of safety training.

___________________________ is the key to a safe and successful stay offshore.

It is advisable to always have your ________________________ with you when heading offshore.

Have an adequate supply of personal items, including any medications you might need. All prescriptions must be in the original containers. Discuss what medications you are taking and the reasons you are taking them with your supervisor prior to your assignment.

At minimum, you must have an approved hard hat, safety glasses, safety boots, and PFD to access transportation offshore. Check your company policy. Certain items that may be a safety hazard or an environmental problem are not allowed offshore by many operators, such as:

- Butane lighters and self-striking matches
- Plastic garbage bags
- Weapons, alcohol and illegal drugs

Environmental Regulations
Be aware of operating procedures offshore. Besides industry standards, there are special environmental regulations that apply to offshore work. The Bureau of Safety and Environmental Enforcement (BSEE) requires all offshore workers to view the training video produced by the offshore operators committee entitled Think About It. It is illegal to throw any materials, liquids or solids, overboard from platforms or boats. Your host company will mark containers to handle all wastes. All waste materials are to be disposed of properly in covered containers to avoid accidental loss.

It is _________________ to throw any materials, liquids or solids, overboard from platforms or boats.

Arrival at Shorebase
Most of you will do a lot of driving to get to shorebases on the Gulf of Mexico (GOM). You may be required to arrive early in the morning. These places may be remote and driving long distances can be very demanding. Arrive alive. Rest and a good vehicle are essential.

Upon arrival, you will have to check in with a dispatcher or security. Be prepared for inspection of your personal gear. After providing the dispatcher with the requested information, you will be instructed to standby in the waiting area. Many times there will be a transportation safety video to watch. Make it a point to watch the video if you are not familiar with the operation or have not gone offshore before at this location.
Helicopter Transportation
The helicopter pilot is always the person in charge while onboard. There is generally no smoking allowed around the helicopter operation or in the helicopter during flight. Always wear your seat belt for the entire flight. You should also don hearing protection and a PFD for the entire flight.

The helicopter pilot is always the person __________________________ while onboard.

Never attempt to carry illegal substances or hazardous materials onboard a helicopter. If you are carrying a hazardous material that is work specified you must file the proper paperwork in advance and advise the pilot of it.

Approaching the Helicopter
Before you approach the helicopter, take an inventory of the helicopter that you will be boarding and other helicopter operations in the area. Do not approach the helicopter until you are motioned to do so by the pilot. If you are first in line, make eye contact and follow his instruction.

When motioned to approach and board the helicopter, secure your personal items such as caps, scarves, and other items that could be blown away. If something should be blown away, do not chase after it. Keep any item that is longer than four feet in the horizontal position in order to keep it out of the main rotor.

Always approach a helicopter from the side and make sure that the pilot knows you are approaching. When approaching, keep low in a crouched position. Proceed to the baggage compartment usually on the side, and in rare cases, at the rear of the helicopter. The general safety rule is to never walk around the rear of the helicopter. Beware of the main and tail rotors. The tail rotor will be turning and in some cases, cannot be easily seen.

The general safety rule is to never walk around the __________________________ of the helicopter.

Beware of the __________________________ and __________________________ rotors.
Boat Transportation
As with the helicopter, the captain is in command of the vessel and has complete authority on the vessel. This includes boarding procedures, loading and unloading of luggage cargo and other items, seating arrangements and smoking restrictions. The captain can refuse to board anyone considered an unsafe passenger.

You must wear your PFD whenever boarding or getting off a vessel. As you approach the loading dock, take a mental inventory of your baggage and belongings. Board the vessel carefully. If you have more than one hand full of baggage or gear, make multiple trips, or have someone assist you.

While on board the vessel, locate the station bill. It will give you important emergency information. Also, locate the life vests and other emergency gear.

Swing Ropes
When you reach your destination via boat, you will have to transfer to the rig or platform. Swing ropes are a common method of making this transfer. If you have not had the opportunity to use the swing rope, it can be a little intimidating at first, especially in bad weather. You make the final decision whether or not to use the swing rope. If you feel uncomfortable, ask for assistance. The boat crew is trained to assist you. If you still feel that you cannot make the swing safely, do not use the rope.

Swing _______ are a common method of making this transfer.
Personnel Baskets
Many times a platform will use a personnel basket and crane to transfer workers. It is important to anticipate the lift and set down. Keep your knees bent to better absorb the shock. Be sure to maintain a good grip on the basket.

Many times a platform will use a ____________________________ and crane to transfer workers.

Arrival Offshore
Whether you arrive by boat or helicopter, you will be introduced to a new environment. Your first task will be to get yourself and gear to the person in charge for check in. If you have more gear than you can carry with one hand, get help or make several trips. Keep one hand free to help stabilize yourself as you walk. Use caution on walkways.

During your check in, you may be informed of your sleeping assignment, eating accommodations, and be given a site specific orientation. The site specific orientation will discuss the station bill, the emergency evacuation procedures, hazardous conditions, and the rules and regulations of the facility.

The site specific orientation will discuss the ____________________________, the emergency evacuation procedures, hazardous conditions, and the rules and regulations of the facility.
Water Survival
Station bills, site specific orientations, drills, and company training programs are all designed to increase your chance of survival if you should have to enter the water. But in the end, it will depend on you. Know the location of life rings, lifeboats, and escape capsules on the rig or platform and know how to use them.

<table>
<thead>
<tr>
<th>Personal Flotation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
</tr>
<tr>
<td>This will give you the most buoyancy and keep your head out of the water, even if you are unconscious. This type should be donned in all emergency situations.</td>
</tr>
<tr>
<td><img src="image" alt="Type I PFD" /></td>
</tr>
<tr>
<td>Type IV</td>
</tr>
<tr>
<td>This is not worn by workers, but is a projectile device that is used for man overboard situations. These will be attached to a rope and should be thrown to the victim, giving them something to float on until someone can retrieve them and to keep them from drifting away with the current.</td>
</tr>
<tr>
<td><img src="image" alt="Type IV PFD" /></td>
</tr>
<tr>
<td>Type V</td>
</tr>
<tr>
<td>This is a lightweight PFD designed to be less restrictive to arm movements. It is often referred to as a work vest.</td>
</tr>
<tr>
<td><img src="image" alt="Type V PFD" /></td>
</tr>
</tbody>
</table>

If you have to enter the water, do not jump unless it is the only option. By jumping, you increase the risk of hurting yourself on the way down and possibly landing on someone who is in the water. When in the water, try to stay calm, stay in a group, conserve energy and body heat, and await assistance.

If you have to enter the water, do not ________________ unless it is the only option.
Safety and Environmental Management Systems (SEMS)
Safety and Environmental Management Systems

This module will examine BSEE’s Safety and Environmental Management Systems (SEMS) standard. Safety is a concern, so the offshore oil and gas industry and the government are working together to reduce accidents. In response to accidents in the offshore oil and gas industry, the federal government called for the adoption of a safety and environmental management approach. This program requires companies to document each step of their processes and the hazards posed to workers. This information is vital for the safety of workers at offshore facilities and will be communicated to them for awareness of the hazards. This module will address what information needs to be communicated, the steps of the detailed safety plans that these regulations require, their applications and the responsibilities of the company and contractors at these facilities.

Safety is a concern, so the offshore oil and gas industry and the __________________________ are working together to reduce accidents.

In response to accidents in the offshore oil and gas industry, the federal government called for the adoption of a __________________________ approach.

BSEE, formerly known as the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), is the federal agency that regulates the safety of the offshore oil and gas industry. BSEE announced on October 15, 2010 that they would make it a requirement that all oil, gas and sulfur operations and facilities in the Outer Continental Shelf (OCS) have SEMS in place. An earlier effort by the industry to employ a safety management approach resulted in the American Petroleum Institute Recommended Practice (API RP) 75 guidelines. This recommended practice had been in place for several years and many companies voluntarily followed these recommendations. Regulatory agencies have been working on safety management requirements within the last couple of years, but as a result of the Deepwater Horizon incident, officials decided it was necessary to expedite the implementation of those requirements.

The federal agency that regulates the safety of the offshore oil and gas industry is now known as the __________________________.

An earlier effort by the industry to employ a safety management approach resulted in the __________________________ guidelines.

SEMS uses a systematic approach to ensure that all steps of every OCS operation are analyzed. It covers every aspect of offshore operations in order to provide the same goal as PSM, which is to minimize the potential of operation failures, procedures or equipment which may result in potential spills or releases of these materials.

The original SEMS rule, which went into effect on November 15, 2011, had four principal objectives. These objectives were to mitigate negative consequences of human error and poor organization in the offshore industry, to promote continuous improvement in regards to the offshore industry’s safety and environmental records, to encourage performance-based operating practices and to promote public interests of offshore safety and environmental protection. While these four objectives still remain the focus of SEMS, the SEMS II final rule expounds, revises and adds new requirements to the original SEMS rule. SEMS II became effective June 4, 2013. Operators have until June 4, 2014 to comply with all provisions of SEMS II with the exception of audits. SEMS audits must be in compliance with SEMS II by June 4, 2015.
Safety and Environmental Management System Requirements
The original SEMS rule requires operators to develop a detailed program comprised of the following elements:

- General provisions
- Safety and environmental information
- Hazard analysis
- Management of change
- Operating procedures
- Training
- Safe work practices
- Mechanical integrity for critical equipment
- Pre-startup review
- Emergency response and control
- Incident investigation
- Audit of program elements
- Records and documentation

Program Element Overview
General Provisions
The SEMS general requirement focuses on properly managing the SEMS program. Implementation and effectiveness of the SEMS plan requires sound management, which makes this one of the most important elements. Section 1, General Provisions of a SEMS plan, is not optional and is not designed only for companies with forward thinking management. This section discusses management’s role in selecting proper personnel to perform safety and auditing responsibilities, establishing goals and performance measures for program effectiveness, developing written descriptions of policies, establishing organizational structure and other management responsibilities that can help to ensure an effective SEMS program. The company must develop a document that commits the company to the development and implementation of a comprehensive SEMS plan. This document requires signatures from senior management of the company and possibly the senior management of contractor companies to ensure full participation in the SEMS plan.

Section 1, General Provisions of a SEMS plan, is _________ optional and is __________ designed only for companies with forward thinking management.

Safety and Environmental Information
This element requires that companies must compile process-based written safety and environmental information in order for workers involved in operations to identify and understand hazards posed by the processes. Information should include the hazards of the chemicals being used, process technology and process equipment being used.

Hazard Analysis
The SEMS program requires that the company perform an initial process hazard analysis. This should be performed at the facility level on equipment and processes to ensure that hazards are identified and evaluated prior to workers performing operations. Hazard analysis must include considerations such as the extent of process hazards, number of potentially affected workers, age of process and the history of the process. Various methods are allowed for evaluating the hazards, but they must address process hazards, previous incidents, effectiveness of engineering and administrative controls, consequences of failures, human factors and evaluation of possible safety and health effects on workers. The hazard analysis should be reviewed and validated periodically. Any potential hazard that is determined must be controlled using engineering or administrative controls. If neither one of these controls is possible, then workers should be protected with PPE or additional training.
Management of Change
Under management of change (MOC), companies must develop a written plan for managing changes any time permanent or temporary changes are made to equipment, operating procedures, personnel, materials, technology or operating conditions. MOC is not required for situations involving “changes in kind,” which would consist of component changes of the same performance capabilities. Whenever changes are made in the workplace, new hazards may be unintentionally introduced. In order to recognize and mitigate new hazards, all changes need to be reviewed prior to their implementation and the following steps should be taken:

• The technical basis of the change should be established
• Analyze the impact of the change on safety, health, and the environment
• The time period necessary for the change
• Approval or authorization requirements must be met

Once the change is approved, any worker whose job will be affected by the change must be informed and trained regarding the change. This training must take place prior to start-up of the process with the change in place. If the change requires adjustments to be made to the operating procedures, the changes need to be documented and dated in the program. The MOC process under SEMS cannot be ignored if it would delay a project or make a project more expensive.

Operating Procedures
Companies must develop and implement written operating procedures that provide clear instructions for safely conducting activities required for proper operation of each process. These operating procedures should be reviewed periodically and updated if changes need to be made.

There should be specific procedures written for initial start-up, normal operations, temporary operations, emergency operations, normal shutdown, start-up after turnarounds, operating limits, safety and health considerations and safety systems.

Training
Training is very important for any program; it is especially important for SEMS. Each worker involved in an operation must be trained before they are allowed to operate the process. The training should focus on specific safety and health hazards, emergency operations and safe work practices applicable to the operating task. Training should be documented and there should be a means of verification that workers are properly trained to perform their job functions. This may require a worker to physically show the necessary skill and knowledge to perform the job.

Training is also important for workers going to a location that is required to follow the SEMS regulation. SEMS requires that host companies only select contractors who are trained and capable of performing their jobs safely. This will require that workers going to these particular facilities have an acceptable level of training for the particular job that they will be performing.

It is important that all training is documented. Workers and companies are responsible for keeping track of training records, certifications and evaluations.

Safe Work Practices
SEMS makes companies responsible for the safety of contract workers at their facilities. This requires certain responsibility from both host and contract companies to ensure that the contract workers at these facilities can safely perform their job.

Each contract company must develop and implement their own safe work practices for the work they will be conducting. The company will request the safe work practices of any contractors performing work at their facility and will allow the contractor to review their SEMS program. The company will require that the safe work practices of the contractor meet or exceed their requirements to perform work. If there are any differences in their programs, a bridging document will be used to document and agree upon the necessary program to use.
Mechanical Integrity
The company must develop written procedures providing instructions to ensure that equipment is working properly and is fit for service. In order to keep equipment in proper working condition, these procedures should address periodic inspections, testing and quality assurance when manufacturing or purchasing equipment. Mechanical integrity programs should include all equipment at the facility used in chemical release prevention.

Mechanical integrity programs should include all ______________________ at the facility used in chemical release prevention.

Pre-startup Review
SEMS requires that whenever processes are started, whether it is for new or modified systems, safety and environmental reviews be conducted in order to minimize the potential for any incidents or injuries during start-up. The review should ensure proper equipment construction, implementation of procedures and safe work practices and that safety information and hazard analysis are current and have been implemented. The review also ensures that training and communication of changes have taken place.

SEMS requires that whenever processes are started, safety and environmental reviews be conducted in order to _____________________ the potential for any incidents or injuries during start-up.

Emergency Response and Control
In order to ensure worker safety while working at the facility, companies are required to have emergency response and emergency action plans in place and ready for implementation. Drills will be performed periodically to prepare workers. These drills should be critiqued to discover weaknesses in the plan and fix them accordingly.

Incident Investigation
Companies must thoroughly and promptly investigate any incident which possesses the potential for serious safety or environmental consequences. These investigations should include the nature of the incident and the factors that caused it, but the main focus should be on recommended changes and corrections that can be made to prevent this situation from occurring again. These investigations should be documented and retained for evaluation or future information. If asked to participate in an investigation, give accurate information. Worker input may be vital in determining the root cause of the incident and be used to prevent future incidents.

If asked to participate in an investigation, give __________________ information.

Audit of Program Elements
In order for companies to ensure that they are within compliance of the SEMS standard, they will be required to be audited within 3 years of implementation and periodically audited at least every 3 years. The person conducting the audit is required to be knowledgeable of the process. These audits not only determine if companies are within compliance of the standard, but also prove useful in evaluating the program and making improvements.

Records and Documentation
It is important to keep documentation of all information that is required of the standard. This information is vital to maintain compliance and beneficial for evaluations used to continue improving and developing programs. All SEMS records and documentation must be kept for at least 6 years with the exception of the following documents which must be archived for 2 years:

- JSAs
- Management of change provisions
- Injury/illness logs
- Evaluation of contractor safety programs and procedures

JSAs, management of change provisions, injury/illness logs and evaluation of contractor safety programs and procedures must be archived for _____________ years.
SEMS II adds four more topics to the list. These topics include stop work authority, ultimate work authority, employee participation plans and guidelines for reporting unsafe working conditions. Topics that have been revised and expanded on include job safety analyses and audits.

**Stop Work Authority**

Operators’ stop work authority procedure must give all workers the responsibility and authority to stop work or decline to perform work when an imminent risk or danger exists. Workers must be given permission to enact this right without fear of punishment. The person in charge of the work is responsible for making sure that the work is stopped in an orderly and safe fashion. Any worker who is notified to stop work must immediately comply. Work can resume once the person with ultimate work authority has decided that no imminent danger or risks exist. The decision must be documented in writing as soon as possible.

Every worker who works on the OCS must be trained on stop work authority procedures. All new workers must receive stop work authority training during orientation. All training must be documented and these documents must be kept onsite for no less than 30 days. Stop work authority procedures must be reviewed during all meetings regarding safety and must be a standard statement on all JSAs.

**Ultimate Work Authority**

The authority assigned to an individual or position to make final decisions relating to activities and operations of the facility is known as ultimate work authority. This individual must be identified in each facility’s SEMS program. When multiple facilities are working together or are in close proximity to one another, the SEMS program must identify the worker who has ultimate work authority over the entire operation. It is important that operators make sure all workers clearly know who has ultimate work authority at all times.

**Employee Participation Plans**

These plans were enacted in order to guarantee management’s recognition and involvement of employees during the development, implementation and revision of the company’s SEMS program. It is management’s responsibility to create a written plan of action describing how employees will participate in the development and implementation of the company’s SEMS program. All documents are to be maintained for 2 years and be made available to BSEE upon request.

**Guidelines for Reporting Unsafe Working Conditions**

Reporting information must be posted at the place of employment in a frequently visited, visible location. This information must take into account all USCG reporting requirements, must include procedures for all works to report unsafe working conditions, and must be included in the company’s SEMS program.

**Job Safety Analysis**

This hazard assessment technique helps identify risks to workers and determine the appropriate ways to mitigate these risks. JSAs must include every worker involved with the activity. They must be prepared, conducted, and approved at the operations/task level for all OCS activities defined in the company’s SEMS program. JSAs must be conducted and signed by the immediate supervisor of the crew. The individual designated as having ultimate work authority must approve and sign all JSAs before the work can begin. They must be maintained for the life of the operation at the facility. The results of the JSA must be documented in writing and this record must be kept for 30 days. These records must be maintained for 2 years and must be made available to BSEE upon request.

**Audits**

Audits are conducted to guarantee effective performance of each facility on the OCS and to make sure that each SEMS program is maintained and kept up to date. Every company that performs work on the OCS must have their SEMS program audited by an accredited service provider (ASP). BSEE may require companies to have an ASP audit of their SEMS program if BSEE identifies safety or non-compliance concerns based on the results of the inspections and evaluations, or as a result of an event. All SEMS audits must be kept for 6 years and must be made available to BSEE upon request.
Responsibilities

Host Company Responsibilities
The host company must ensure that any contractors that will be performing work at the facility are capable of doing these tasks in a safe manner. In order to determine that workers will be able to work in accordance with the process safety management program, the contractors will be required to submit safety programs, safety performance records, and safety training information to be evaluated by the company. This assures that safety will be a top priority. Periodic observation should be performed by the host company to evaluate whether or not contractors are working within the scope of the standard.

In order to communicate the hazards of the facility, the host company must make the contract company aware of any specific hazards with process operations. In the case of an emergency, the host company must review the emergency response procedures with contractors prior to beginning work.

Contract Company Responsibilities
Contractors need to ensure that workers have been trained to safely perform job tasks. They must have documentation of training including worker name, date of training and a means to verify that the worker understood the training. Contract companies should also inform workers of the potential hazards that they may encounter at the facility and the necessary emergency action to take in the case of such encounters. Contractors need to inform the host facility of any additional hazards that their operations may present.

Contract Worker Responsibilities
As a contract worker, your responsibility will be to participate in safety training, perform work safely in accordance with any applicable policies and procedures, stop work if any unsafe work is noticed and have a general understanding of the SEMS standard and the components that will affect you. As a worker, a BSEE investigator may ask questions about your company's SEMS program. When interviewed by BSEE personnel, workers are expected to demonstrate a basic understanding of the SEMS provisions that affect their job. The investigator is not trying to get you in trouble or cause any problems. They are determining if you are properly trained to perform your assigned work. The main goal is your safety. If this does happen, do not be nervous. Answer any questions honestly and to the best of your ability.

Contractors need to ensure that workers have been trained to __________________ perform job tasks.

When interviewed by BSEE personnel, workers are expected to demonstrate a basic ________________ of the SEMS provisions that affect their job.
BASIC ORIENTATION

Terrorism Response
Awareness Program (TRAP)

APEC
Terrorism Response Awareness Program

On 9/11, national security was comprised with the attacks on the World Trade Center, the Pentagon, and United Airlines Flight 93. The US federal government recognized that international terrorism was possible and that it threatened the safety of the nation. New laws and regulations were written and businesses were put on high alert. It brought much needed attention to the importance of national security. Unfortunately, terrorism is and will continue to be a threat in our world today. While governments work to suppress the problem, you need to be on your toes to recognize potential threats. The Terrorism Response Awareness Program (TRAP) is one way to bring security awareness to oil and gas industry workers.

___ is one way to bring security awareness to oil and gas industry workers.

Appearances may not be a good indicator to recognize a terrorist. The diversity of terrorist groups, each with members of widely divergent national and sociocultural backgrounds, contexts, and goals, underscores the hazards of making generalizations and developing a profile of members of individual groups or of terrorists in general.

Terrorism

The Federal Bureau of Investigation (FBI) defines terrorism as the unlawful use of force against persons or property to intimidate or coerce a government, the civilian population or any segment thereof, in the furtherance of political or social objectives. What makes the terrorist event so dangerous is that it is intended to cause damage, inflict harm and in some cases kill. A terrorist threat includes motive and ability. Law enforcement agencies will determine whether a threat exists. Only first responders who are properly trained should be involved after a terrorist attack. Bombing incidents may cause a sequence of events carefully timed to inflict further harm on those whose job it is to respond to assist others.

What makes the terrorist event so dangerous is that it is intended to cause ________________, to inflict ________________ and in some cases to ________________.

While the oil and gas industry in the US has escaped serious threat, facilities in other parts of the world have been targeted in the past. Reports from the DHS, the US Department of State and the FBI have indicated that the petroleum industry may be a target of terrorism due to the inherent nature of the products used. Specifically, the petroleum industry may be a target for terrorism due to the following:

- Physical and chemical properties of the products handled at facilities
- Importance of petroleum to the national economy
- Importance of petroleum to national security
- Symbolism of the industry as a cornerstone of capitalism and western culture

By injuring the workforce, a terrorist can be an effective force to harm the industry as a whole. Be aware of the potential for human harm. There are four routes of entry into the human body:

- Inhalation
- Absorption
- Ingestion
- Injection

There are four routes of entry into the human body: ________________, ________________, ________________ and ________________.
B-NICE is one way to remember the five categories of terrorist threats. The five categories of terrorist threats are:

- Biological – release of bacteria, viruses or other agents causing illness or death
- Nuclear – threat or actual detonation of a nuclear device or dirty bomb
- Incendiary – mechanical, electrical or chemical device used intentionally to initiate combustion and start a fire
- Chemical – release of chemicals, such as nerve agents, to cause illness or death
- Explosive – use of a device to cause an explosion

The five categories of terrorist threats are ________________, ________________, ________________, ________________, and ________________.

Biological - There are four types of biological threats:
- Bacteria
- Rickettsia
- Virus
- Toxins

Nuclear - There are two types of nuclear threats:
- Use, threatened use or threatened detonation of a nuclear bomb
- Detonation or threatened detonation of a conventional explosive incorporating nuclear materials (radiological dispersal devices (RDD))

Incendiary - An incendiary device consists of three basic components:
- An igniter or fuse
- A container or body
- An incendiary material or fiber

Chemical - There are five types of chemical threats:
- Nerve agents - disrupt nerve impulse transmissions
- Blister agents - cause sever burns to eyes, skin and tissues of the respiratory tract
- Blood agents - interfere with the ability of blood to transport oxygen
- Choking agents - severely stressed respiratory system tissues
- Irritating agents - cause respiratory distress and tearing designed to incapacitate

Explosive - There are two types of explosive threats:
- Substance or article, including a device, designed to function by explosion
- Substance or article, including a device, that by chemical reaction within itself, can function in a similar way even if not designed to function by explosion, unless the substance or article is otherwise classified

When it comes to stopping terrorism on the platforms, rigs and other facilities offshore, as well as refineries, plants or other onshore facilities, it is every worker’s responsibility to play a role in stopping terrorism. Security measures, such as photo ID cards and programs like TRAP are necessary in the workplace to aid in controlling outside influences that might adversely affect workers.

It is every worker’s ________________ to play a role in stopping terrorism.

Worker Responsibility
It takes a team to stop terrorism and every worker is part of the team. A safe attitude can make a difference in preventing attacks. Workers with a safe attitude understand that they must get involved in order to make the jobsite safe.

Attend safety meetings and other events where methods of preventing terrorist acts are discussed. Terrorism awareness and prevention methods should be a regular part of safety ________________.
Regularly be on the lookout for suspicious persons, actions or objects. As you get to know your job and jobsite thoroughly, you will become more aware of things that seem out of place. It may be someone who stops outside a facility and takes pictures or even a coworker who is in an unauthorized area. Attacks have been prevented because someone saw something that just did not seem right.

Company Responsibility
Identify site specific potential target areas. Maintain security on premises. Provide proactive awareness training in terrorist response. Require photo IDs on all workers.

Suspicious Behavior
Do not confront trespassers or other suspicious people. Let trained security personnel handle the situation. While most of these types of situations consist of lost visitors or new workers, they must all be treated as a threat to security. It only takes one breach of security for a unnecessary tragedy to occur.

The following is a list of activities to watch out for that could aid in preventing a terrorist attack:
- Unknown person photographing facilities
- Unknown person loitering outside or trying to enter the grounds
- Unknown person loitering in a vehicle or boat near facilities for extended periods
- Unknown person calling, emailing or asking about facilities, schedules or workers
- Missing passes, identification, badges, company vehicles, uniforms, etc.
- Suspicious packages unattended

Reporting Suspicious Activities
Immediately report anything suspicious to your supervisor. Your supervisor will be responsible for further contact with outside law enforcement. If you see something or someone who looks suspicious, gather as much relevant information as you can.

Some important things to take notice of may include:
- ID confirmation
- Time and location of activity
- Physical descriptions of individuals
  - gender
  - race
  - height
  - weight/build
  - scars/tattoos/piercings
  - hair color/cut
  - age
  - clothing
- Make, model and color of vehicles
- License plate numbers
- Descriptions, name and registration numbers of boats
Security
Security personnel should be trained on how to respond to violent incidents and in handling threats or other confrontations. Security should also have an up to date contact list for all workers and outside emergency contacts. Security measures taken by your company may include:

- Adequate lighting and visibility in parking lots or other dark areas
- Alarm signals or emergency phones
- Signs indicating that areas are off limits to unauthorized workers
- Barriers to keep vehicles from entering the facility, except through the main gates
- Checkpoints where IDs can be verified and vehicles can be searched
- Badges or vehicle passes
- Arrangement of work space so workers cannot be trapped in a small area
- Adequately marked escape routes

Your vehicle, luggage or toolbox may be subject to inspection by your company, the facility operator or the United States Coast Guard (USCG). Carry your PEC photo ID card and be prepared to display it when entering operator facilities.

Special precautions need to be taken to make sure that no unauthorized person is capable of gaining access to safety sensitive items. These items may include:

- Chemicals, explosives and incendiary devices
- Radiation sources for x-rays
- Food storage areas
- ID cards, driver’s licenses and other items containing personal information
- Blueprints or charts showing restricted information
- Personnel schedules, route schedules, etc.

Restricted areas require a higher level of security. Only authorized workers will have access to restricted areas. Controlled access means that only authorized personnel are allowed in a specific area of a jobsite. If you do not have permission to enter, stay out.

Transportation Worker Identification Credential (TWIC)
If you are going to work offshore or at a waterfront facility, you may be required to have a TWIC card. Anyone who requires unescorted access to ‘secure areas’ of ports, maritime facilities, vessels, and offshore platforms must acquire a TWIC card. A TWIC card is valid for five years from the issue date.

If you work offshore or at a waterfront facility, you may be required to have a ________________ card in order to work.
Communication is an important part of preventing and reacting to terrorist threats. It does not do much good for workers to be alert to suspicious activity if they do not report them. It is also important for workers to know any company or site specific security information. There are certain means of communication that can be implemented:

- Terrorism awareness and prevention should be part of safety meetings
- Employees should report any suspicious persons, actions or objects
- Security alerts notifying employees through an established warning tone/signal
- National Terrorism Advisory System (NTAS)

**Transporting Goods and Equipment**

Transporting goods and equipment to and from facilities can present its own potential risks. Containers shipped to or from the facility must be properly secured, locked and labeled. Normal hazard communications rules apply for all chemicals being transported. When items arrive at the worksite, make sure that locks are intact. Observe and report any unknown or suspicious personnel loitering near equipment.

Containers shipped to or from the facility must be properly __________________, __________________ and __________________.

DOT requires security plans and special training for shippers and carriers of certain hazardous materials, explosives, and radioactive material. DHS asks the public to report suspicious activity involving critical infrastructure, such as refineries, to the FBI or the National Infrastructure Coordinating Center (NICC).
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AC</td>
<td>Alternating Current</td>
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<tr>
<td>AED</td>
<td>Automated External Defibrillator</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
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<tr>
<td>APR</td>
<td>Air-purifying Respirator</td>
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<td>ASTM</td>
<td>American Society for Testing Materials</td>
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<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
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<tr>
<td>ATPV</td>
<td>Arc Thermal Protective Value</td>
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<tr>
<td>BBS</td>
<td>Behavior Based Safety</td>
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<tr>
<td>BLS</td>
<td>Bureau of Labor Statistics</td>
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<tr>
<td>BOEMRE</td>
<td>Bureau of Ocean Energy Management, Regulation and Enforcement</td>
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<tr>
<td>BSEE</td>
<td>Bureau of Safety and Environmental Enforcement</td>
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<tr>
<td>CATV</td>
<td>Community Access Television</td>
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<tr>
<td>CDL</td>
<td>Commercial Driver's License</td>
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<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
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<td>dB</td>
<td>Decibels</td>
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<tr>
<td>DEA</td>
<td>Diethanolamine</td>
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<td>DHS</td>
<td>Department of Homeland Security</td>
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<td>DOT</td>
<td>Department of Transportation</td>
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<td>DUI</td>
<td>Driving Under the Influence</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>ERG</td>
<td>Emergency Response Guidebook</td>
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<tr>
<td>FBI</td>
<td>Federal Bureau of Investigation</td>
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<td>FMCSA</td>
<td>Federal Motor Carrier Safety Administration</td>
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<td>FRC</td>
<td>Fire/Flame Retardant Clothing</td>
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<tr>
<td>GFCI</td>
<td>Ground Fault Circuit Interrupter</td>
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<td>GOM</td>
<td>Gulf of Mexico</td>
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<td>H₂S</td>
<td>Hydrogen Sulfide</td>
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<td>HazCom</td>
<td>Hazard Communication</td>
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<td>Hazmat</td>
<td>Hazardous Material</td>
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<td>HAZWOPER</td>
<td>Hazardous Waste Operations and Emergency Response</td>
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<td>HBV</td>
<td>Hepatitis B Virus</td>
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<td>HCV</td>
<td>Hepatitis C Virus</td>
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<td>HIPAA</td>
<td>Health Insurance Portability and Accountability Act</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>HMIS</td>
<td>Hazardous Material Identification System</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>HSE</td>
<td>Health, Safety and Environment</td>
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<tr>
<td>IDLH</td>
<td>Immediately Dangerous to Life and Health</td>
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<tr>
<td>JSA</td>
<td>Job Safety Analysis</td>
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<tr>
<td>JSEA</td>
<td>Job Safety Environmental Analysis</td>
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<td>kV</td>
<td>Kilovolts</td>
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<tr>
<td>LEL</td>
<td>Lower Exposure Limit</td>
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<tr>
<td>LOTO</td>
<td>Lockout/tagout</td>
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<td>MMMF</td>
<td>Man-made Mineral Fibers</td>
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<td>MOC</td>
<td>Management of Change</td>
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<tr>
<td>MSDS</td>
<td>Material Safety Data Sheet</td>
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<tr>
<td>N$_2$</td>
<td>Nitrogen</td>
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<tr>
<td>NEC</td>
<td>National Electric Code</td>
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<td>NFPA</td>
<td>National Fire Protection Association</td>
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<tr>
<td>NICC</td>
<td>National Infrastructure Coordinating Center</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<tr>
<td>NORM</td>
<td>Naturally Occurring Radioactive Material</td>
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<td>NRR</td>
<td>Noise Reduction Rating</td>
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<td>NTAS</td>
<td>National Terrorism Advisory System</td>
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<td>NWS</td>
<td>National Weather Service</td>
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<td>OCS</td>
<td>Outer Continental Shelf</td>
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<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
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<tr>
<td>PASS</td>
<td>Pull, Aim, Squeeze and Sweep</td>
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<tr>
<td>PEC</td>
<td>Petroleum Education Council</td>
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<tr>
<td>PFD</td>
<td>Personal Flotation Device</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>ppm</td>
<td>Parts Per Million</td>
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<tr>
<td>PSM</td>
<td>Process Safety Management</td>
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<tr>
<td>RDD</td>
<td>Radiological Dispersal Devices</td>
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<tr>
<td>RP</td>
<td>Recommended Practice</td>
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<tr>
<td>SAR</td>
<td>Supplied-air Respirator</td>
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<tr>
<td>SCBA</td>
<td>Self-contained Breathing Apparatus</td>
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<tr>
<td>SEMS</td>
<td>Safety and Environmental Management Systems</td>
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<tr>
<td>SIMOPS</td>
<td>Simultaneous Operations</td>
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<tr>
<td>SO$_2$</td>
<td>Sulfur Dioxide</td>
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<td>SOAP</td>
<td>Situation of Accident Potential</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>SPF</td>
<td>Sun Protection Factor</td>
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<td>SSE</td>
<td>Short Service Employee</td>
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<td>SWL</td>
<td>Safe Working Load</td>
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<tr>
<td>TRAP</td>
<td>Terrorism Response Awareness Program</td>
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<tr>
<td>TSD</td>
<td>Treatment, Storage and Disposal</td>
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<tr>
<td>UL</td>
<td>Underwriters Laboratories</td>
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<tr>
<td>USCG</td>
<td>United States Coast Guard</td>
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<tr>
<td>UV</td>
<td>Ultraviolet</td>
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<tr>
<td>WVP</td>
<td>Workplace Violence Prevention</td>
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Glossary
absorption – The entrance of a substance into the body by passing through the pores of the skin or covering of the eyes.

administrative control – The use of policies, procedures, training and supervisory measures to minimize exposure to hazards.

adverse weather conditions – Adverse weather conditions include events such as lightning, windstorms, UV exposures, snow and ice, flooding, and extreme temperatures.

affected employee – An employee that operates or uses the equipment being serviced under LOTO.

air-purifying respirator (APR) – A respirator that takes air that is contaminated with one or more types of pollutants, removes a sufficient quantity of those pollutants and then supplies the air to the user.

atmosphere-supplying respirator (ASR) – A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied air respirators (SAR) and self-contained breathing apparatus (SCBA) units.

authorized employee – Perform LOTO and can apply or remove LOTO. These employees identify the types and magnitude of energy associated with equipment, must understand the hazards of energy found on the jobsite, know methods of control and notify affected employees when LOTO is removed.

authorizing person – The individual designated to authorize permitted work.

barricading – An obstruction to deter the passage of persons or vehicles.

barricading permit – Generally required prior to any barricading to ensure that access of emergency vehicles is not impeded as a result of the barricades and to ensure that dangerous situations are shielded by barricading.

behavior – An observable manner of conducting oneself.

behavior based safety (BBS) – Observing what people do, analyzing why they do it and applying an intervention strategy to improve proactive and safe work practices.

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

benzene – A clear, colorless liquid with a sweet distinctive odor. It is potentially toxic, flammable and volatile and may be present in many liquid mixtures.

biological agents – Bacteria, viruses, fungi (yeasts and molds) along with parasites.

biological hazard – Biological substances that pose a threat to the health of living organisms.

bloodborne pathogens – Diseases that are transmitted through body fluids such as blood or saliva.

body harness – A device used to minimize injuries from a fall by maintaining the body in a vertical position and distributing the forces of the fall across the body.

carbon dioxide (CO₂) – Non-toxic, non-flammable, colorless, tasteless and odorless gas.

communication – The exchange of thoughts, messages or information by speech, signals, writing or behavior.

confined space – A space or work area where there are limited openings for entry and exit and where there is unfavorable natural ventilation. It may contain or produce air contaminants and is not designed for continuous employee occupation.

contact injury – Injuries such as skin diseases and temperature or chemical burns.
**contraband** – Goods or merchandise whose importation, exportation or possession is forbidden. These items are not permitted at the jobsite.

**decibel (dB)** – A unit of measurement of sound level.

**de-energized** – Parts of the circuits that have been disconnected from all their power sources and present less of an electrical hazard. Has the power off.

**diethanolamine (DEA)** – A white solid or colorless liquid normally used to scrub gasses and can be found as a component of drilling fluid.

**don** – Put on equipment.

**driver distraction** – Specific type of inattention that occurs when drivers divert their attention away from the task of driving to focus on another task instead.

**driving under the influence (DUI)** – Driving while intoxicated from alcohol or other drugs and is considered a criminal offense.

**elimination** – A method to completely remove a hazard.

**emergency response guidebook (ERG)** – Contains emergency response information for each hazardous chemical in the form of color-coded guides.

**energized** – Exposed, life parts of circuits that may be directly contacted, contacted by tools or contacted by materials. Has the power on.

**energy isolating device** – A mechanical device that physically prevents the transmission or release of energy.

**engineering control** – Controls that isolate or remove the hazards from a jobsite.

**entrant** – A person who enters a confined space to perform a task.

**entry** – The action by which a person passes through an opening into a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant’s body breaks the plane of an opening into the space.

**entry permit** – Permit required prior to any entry and must be posted at the primary entrance.

**entry supervisor** – The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry.

**ergonomics** – The scientific study of the relationship between workers and their environment, including the equipment they use to perform their job.

**excavation** – Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

**exploration and production waste** – Waste associated with drilling and the production of oil and gas. It is exempt under EPA regulations although state regulations may control it.

**extinguish** – To put out or to quench.

**fall arrest system** – Consists of a full body harness, a lanyard, a fall brake and a tie-off point.

**fall protection** – A means to protect a worker from falling from a height.

**fatality** – An accident or disaster resulting in death.
**fire prevention** – Includes proactive measures to ensure fires to not start and involves education as well as taking precautions.

**fire safety** – Precautions taken to prevent or reduce the likelihood of a fire that may result in death, injury or property damage, alert those in a structure to the presence of a fire in the event one occurs, better enable those threatened by a fire to survive and reduce the damage caused by a fire.

**fire watch** – A person or persons assigned to an area for the purposes of protecting the occupants from fire or similar emergencies. Armed with appropriate firefighting equipment, must be on duty when hot work is being done outside of an approved hot work area and must remain on duty for at least a half hour after the completion of hot work operations.

**first aid** – Medical attention that is given immediately after an injury occurs and is usually provided at the scene. It is usually a one time, short term treatment that requires little training or technology to perform.

**fit test** – Medical evaluation to ensure an employee is capable of using a respirator.

**fit to work** – Medical assessment done when a company wishes to be sure a worker can safely do a specific job or task. The purpose is to determine if the worker is medically capable of performing the job or task under the working conditions.

**fixed ladder** – A ladder that is permanently attached to a structure, building, or equipment used where workers frequently visit.

**flammable** – Capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

**flash flood warning** – Flash flooding is occurring; seek higher ground immediately.

**flash flood watch** – Flash flooding is possible; prepare to move to higher ground.

**flood warning** – Flooding is occurring or will occur soon; evacuate if advised to do so.

**flood watch** – Flooding is possible; listen to a weather radio for more information.

**forklift** – A powered industrial truck used to hoist and transport materials by means of steel forks inserted under the load.

**full body harness** – Straps which may be secured about a person in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with means for attaching it to other components of a personal fall arrest system.

**general duty clause** – An OSHA regulation that requires companies to provide a safe and healthful working environment for all workers.

**ground fault circuit interrupter (GFCI)** – A device that interrupts the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

**grounding** – The procedure used to carry an electrical charge to ground through a conductive path. A typical ground may be connected directly to a conductive water pipe or to a grounding bus and grounding rod.

**group lockout** - When servicing or maintenance is performed by a crew, craft, department or other group, they must utilize the LOTO procedures that afford the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

**guarded** – Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casing, barrier rails, or screens to eliminate the possibility of accidental contact with or dangerous approach by persons, animals, or objects.
hand tools – Portable tools that are operated while being held.

harassment – Unwelcome conduct that is based on race, color, religion, sex, national origin, age, disability or genetic information.

hazard – A condition or action that may result in harm or injury to people, property or the environment.

hazard analysis – Application of one or more methodologies that aid in identifying and evaluating hazards (includes risk assessment and JSA).

hazard communication (HazCom) – The process of identifying physical and health hazards associated with the many chemicals a company’s employees use in the performance of their daily job duties.

hazardous atmosphere – An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness or injury.

hazardous material (hazmat) – Any material that has been determined to be capable of posing unreasonable risk to health, safety and property when transported in commerce.

hazardous materials identification system (HMIS) – Uses a number and color system to identify the hazard type and relative degree of the hazard.

hazardous waste – Waste that can be harmful to people or the environment and must receive special handling.

hexavalent chromium – Chemical compounds that contain the metallic element chromium in its positive +6 valence (hexavalent) state. Occupational exposures occur during the production of stainless steel, chromate chemicals and chromate pigments.

hot work – Any process that can be a source of ignition when flammable material is present or can be a fire hazard regardless of the presence of flammable material.

hurricane warning – Hurricane conditions will exist within 24 hours and you should complete all storm preparations as well as leave the area if directed by authorities.

hurricane watch – The threat of a hurricane is within 36 hours and you should be ready to act.

hydraulic – Denoting, relating to, or operated by a liquid moving in a confined space under pressure.

hydrogen sulfide (H2S) – A highly toxic, colorless gas that is formed by the decay of organic materials.

hypothermia – A medical emergency which occurs when body temperature falls to a level where normal muscular and cerebral functions are impaired.

immediately dangerous to life and health (IDLH) – An atmosphere of any toxic, corrosive or asphyxiate substance that poses an immediate threat to life, would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous environment.

incident – An unplanned event that could have or did cause occupational illness, personal injury or property damage.

industrial hygiene – The anticipation, recognition, evaluation and development of controls for occupational health hazards.

ingestion – Taking into the body by the mouth.

inhalation – Breathing in of a substance in the form of a gas, vapor, fume, mist or dust.

injury – An abnormal condition or disorder.
**intervention** – The action to change, slow down or stop an unsafe act or condition.

**job safety analysis (JSA)** – A method that can be used to identify, analyze and record the steps involved in performing a specific job, the existing or potential safety and health hazards associated with each step and the recommended procedure(s) that will eliminate or reduce these hazards and the risk of a workplace injury or illness.

**job-made ladder** – Ladders created at the worksite specifically for the job.

**journey management plan** – A standardized process for planning the movement of people and equipment from one place to another including the communications, route, scheduled stops, risks, hazard warnings, approval, provisioning and monitoring of the trip.

**label** – Any written, printed or graphic material displayed on or affixed to containers of hazardous materials.

**lanyard** – Flexible line of rope wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

**lead** – A heavy metal typically found in paints and coatings.

**lockout** – Placement of a device, typically a lock, on equipment valves or electrical flowlines so they cannot be operated until the device has been removed; preferred method whenever possible.

**lockout/tagout (LOTO)** – A documented system of barriers and notices that prevents the accidental or inadvertent operation of equipment while it is being maintained or inspected.

**lockout/tagout permit** – A permit required when working on equipment or process systems to prevent accidental or inadvertent energizing.

**lower explosive limit (LEL)** - The lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

**manlift** – A device consisting of a power-driven endless belt moving in one direction only.

**marine debris** – Any object that is lost or discarded in the marine environment.

**material safety data sheet (MSDS)** – Written or printed material issued by the chemical manufacturer of chemical substances that sets out the hazards likely to be encountered by those who come into contact with the substance.

**mentoring** – Placing an SSE with an experienced employee until the SSE has become properly trained and experienced.

**mercury** – A silver liquid at room temperature that can alloy or combine with many metals.

**methanol** – A light, volatile, pungent, flammable, poisonous liquid alcohol formed in the destructive distillation of wood or made synthetically. It is used as a solvent, antifreeze or denaturant for ethyl alcohol and in the synthesis of other chemicals.

**mitigate** – To make less severe.

**naturally occurring radioactive material (NORM)** – Naturally occurring radioactive elements found in the environment.

**near miss** – A type of incident which did not result in occupational illness, personal injury or property damage.

**nitrogen (N₂)** – Non-toxic, non-flammable, colorless, tasteless and odorless gas.

**noise reduction rating (NRR)** – A number rating system for hearing protection that is measured in decibels and informs you of how well hearing protectors reduce sound.
**occupational health** – A cross disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment.

**offshore** – Refers to operations that take place beyond the outer continental shelf.

**onshore** – Refers to operations that take place on land.

**other employee** – Should not attempt to start, energize or use machines or equipment that is locked or tagged out.

**oxygen deficient atmosphere** – When the level of oxygen is below that of normal air, around 19.5%.

**oxygen enriched atmosphere** – When the level of oxygen is above that of normal air, around 23.5%.

**parts per million (ppm)** – Parts of a substance per million parts of air. It is a measure of concentration by volume in air.

**permit required confined space** – A confined space that contains or has the potential to contain a hazardous atmosphere, contains a material with the potential to engulf someone who enters the space, has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section, and/or contains any other recognized serious safety or health hazards.

**personal protective equipment (PPE)** – All equipment and clothing which is intended to be worn or held by a worker to provide protection against one or more risks to health or safety.

**personnel basket** – A basket designed to lift personnel into the air by method of crane for offshore transfer.

**placard** – Hazard class identifiers required on transport vehicles or freight containers. Placards are 273 millimeters or 10.8 inches diamond shaped and hazard class color-coded. They may require numbers for identification and emergency response.

**policy** – A plan of action adopted by a company.

**portable ladder** – A ladder not permanently fixed in place and may be used in various locations.

**potential energy** – The energy possessed by a body by virtue of its position relative to others, stresses within itself, electric charge and other factors.

**power tools** – A tool driven by a motor.

**process safety management (PSM)** – The application of management principles, methods and practices to prevent and control releases of hazardous chemicals or energy in the petrochemical industry.

**prohibit** – To forbid (an action, activity, etc.) by authority.

**qualified person** – One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

**recordable event** – Work-related injuries or illnesses that result in death, days away from work, restrictions to work or transfer to another job, medical treatment beyond first aid, loss of consciousness or a significant injury or illness diagnosed by a doctor or another licensed health care professional.

**rescuer** – The personnel designated to rescue employees from a dangerous situation.

**respiratory protection** – Equipment designed to protect the wearer from the inhalation of contaminants.

**rigging** – The use of mechanical load shifting equipment and associated gear to move, place or secure a load including plant, equipment or members of a building or structure and to ensure the stability of those members and for the setting up and dismantling of cranes and hoists.
**right to know** – The legal principle that the individual has the right to know the chemicals to which they may be exposed.

**risk** – The probability and severity of accident or loss from exposure to various hazards, including injury to people and loss of resources.

**scaffold** – A temporary platform, either supported from below or suspended from above, on which workers sit or stand when performing tasks at heights above the ground.

**securement** – Ensures loads do not shift or fall from the vehicle. Laws govern how different types of loads must be secured.

**self-contained breathing apparatus (SCBA)** – An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

**shelter-in-place** – Having workers take shelter and stay indoors until the emergency is over rather than trying to evacuate.

**shielding** – The process of supporting a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses.

**shoring** – The process of supporting a structure such as a metal, hydraulic, mechanical or timber-shoring system that supports the sides of an excavation and that is designed to prevent cave-ins.

**short service employee (SSE)** – New employees or employees new to their position by six months.

**simultaneous operations (SIMOPS)** – Two or more jobs occurring or operating at the same time.

**sloping** – A method of tapering the sides of an excavation. The angle of incline varies with differences in such factors as the soil type, environmental conditions of exposure and application of surface loads.

**solid waste** – Solid materials that are not hazardous.

**stop work** – The authority or obligation to suspend work when health, safety and environmental risks are not understood or have not been clearly established.

**substance abuse** – Improper use of chemical substances which results in impairment.

**substitution** – A control methods that precedes engineering controls. This control method replaces a more toxic substance or hazardous work practice with a less hazardous one.

**sulfur dioxide (SO₂)** – A gas that is heavier than air and is a toxic product of combustion of hydrogen sulfide.

**supplied-air respirator (SAR)** – An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

**swing rope** – A vertically suspended rope knotted on the lower end to provide hand grips, hung above the boat landing on an offshore platform, and used to facilitate personnel transfer between boat and platform and vice versa.

**tagout** – Placement of a special tag or other identifying device is placed on the equipment, valves or flowlines instructing that they shall not be operated until the tagout device has been removed.

**terrorism** – The unlawful use of force against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in the furtherance of political or social objectives.

**terrorism response awareness program (TRAP)** – A training program used to aid in controlling outside influences that might adversely affect workers.
threat – The implication or expression of intent to inflict physical harm or action that a reasonable person would interpret as danger to physical safety.

tie-off point – The act of a worker wearing personal fall protection equipment connecting directly or indirectly to an anchorage. It also means the condition of a worker being connected to an anchorage.

toxic – The characteristic of a substance to produce injury once it reaches a susceptible site in or on the body which may be acute or chronic, local or systemic.

traumatic injury – Injuries requiring doctor care. Includes cuts that require stitches, broken bones, severe burns and amputations.

trench – A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of the trench is not greater than 15 feet.

universal waste – Can be recycled and are not considered hazardous although they must go to an approved facility.

utility hookup permit – A permit required before any utility may be connected.

vehicle-mounted platform – Encompasses any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.

water survival training – Program and practical application of emergency procedures for surviving an unplanned entry into water for personnel who may be required to work or travel on or over water.

work permits – Written authorizations that specify the location and type of work to be performed.

workplace violence – Any action toward an employee that threatens or impacts their physical or mental well-being or an act that causes damage to company property.

zero tolerance – No form of violence or harassment will be tolerated.