



Offshore Oil and Gas Safety II

This is the second of a two-part introduction to offshore safety practices. Offshore oil and gas operations include all activities involved in the extraction of crude oil and natural gas from reservoirs found beneath the seafloor. This course has been developed as a source of information and practical training tool for offshore rig safety personnel, operator/contractor employees, supervisors, and managers who need to be familiar with offshore rig safety.

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OSHAcademy Course 909 Study Guide

Offshore Oil and Gas Safety II

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Contact OSHAcademy to arrange for use as a training document.

This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHAcademy Course 909.

Read each module, answer the quiz questions, and submit the quiz questions online through the course webpage. You can print the post-quiz response screen which will contain the correct answers to the questions.

The final exam will consist of questions developed from the course content and module quizzes.

We hope you enjoy the course and if you have any questions, feel free to email or call:

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Course Introduction

This is the second of a two-part introduction to offshore safety practices. Offshore oil and gas operations include all activities involved in the extraction of crude oil and natural gas from reservoirs found beneath the seafloor.

The 11 lives lost in the 2010 Deepwater Horizon explosion provide a reminder of the hazards involved in offshore drilling.

This course has been developed as a source of information and practical training tool for offshore rig safety personnel, operator/contractor employees, supervisors, and managers who need to be familiar with offshore rig safety.

Once you complete this training, you will know more about the following components:

-) how to protect yourself against electrical shock and other injuries involving electricity on an oil rig
-) how to develop and maintain an effective Safety and Environmental Management System specifically for off-shore drilling rigs
-) proper lockout/tagout (LOTO) practices and procedures to protect workers tools and equipment safety
-) crane operator qualifications and safety precautions
-) control of hazardous chemicals and how to prepare for an emergency involving hazardous chemicals
-) important procedures to assist in handling materials, rigging, and lifting safety to make for safer and less risky environment for workers and equipment

Note: The use of the term “must” in source documents for this training has been replaced with the term “should” because the content of this training is guidance only and does not replace or serve as a substitute for mandatory regulatory requirements detailed in source documents.

Module 1: Electrical Safety Practices

Electrical Safety

Employees should pay special attention to electrical hazards when working on electrical circuits. Coming in contact with an electrical voltage can cause a dangerous level of current (amperage) to flow through the body, resulting in electrical shock and burns. Serious injury or even death may occur due to excessive current. Remember, it's not the voltage that kills, it's the current!

The electrical safety practices discussed here should apply to electrical equipment on facilities located on all the following:

-) platforms
-) artificial islands
-) fixed structures

The areas within which equipment is located are classified according to:

-) API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2, or
-) API RP 505, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2 (as incorporated by reference in 30 CFR 250.198).

Employees who maintain electrical systems should have expertise in area classification and the performance, operation and hazards of electrical equipment.

-) Install all electrical systems according to:
 - o API RP 14F, Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations (as incorporated by reference in 30 CFR 250.198), or
 - o API RP 14FZ, Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and

Class I, Zone 0, Zone 1, and Zone 2 Locations (as incorporated by reference in 30 CFR 250.198).

Installation, Repair, and Maintenance

When installing, repairing, and maintaining electrical equipment:

-) Only competent and authorized employees should perform work on electrical equipment.
-) Only approved procedures and practices should be used.
-) Electrical equipment and components should be properly grounded.
-) A 'Danger – High Voltage' or equivalent sign should be posted in high voltage equipment areas.
-) First aid/CPR posters should be posted in a prominent location near high voltage equipment areas.
-) Ensure that an insulating dielectric mat is used appropriately and maintained in a clean and dry condition.
-) Enclosures and covers for electrical equipment and components should be in place, secure, and properly maintained.
-) The power source for out-of-service electrical equipment should be disconnected.
-) Out-of-service equipment should be clearly marked unless immediate repairs are planned.
-) Proper testing instruments should always be used. The hand or fingers should never be used to test for voltage.
-) Fuses should not be bridged with unapproved conductors. Only use proper fuse pulling tools for replacing fuses.

- J Electrical extension cords should not be spliced.
- J Water should never be used for cleaning electrical equipment or devices.
- J Electrical equipment should never be altered such that it changes the hazard rating.
- J Power tools should be inspected for damage to cords or connections prior to each use.
- J Electrical hand tools should never be used while the worker is standing in water or outside when wet or raining.
- J Before attempting repairs, equipment should be properly lockout/tagged out and disconnected or checked to ensure the power source is off.
- J Employees should never work on live electrical equipment.
- J Metal ladders should not be used for electrical work.
- J Electrical protective equipment should be used, including a dielectric hook, insulated rubber gloves, heat tempered face shield, and dielectric apron when working on high-voltage equipment (600v or greater as per NFPA 70E).
- J Only CO₂ or powder type extinguishers should be used to respond to fires in any electrical equipment or areas.

Cathodic Protection Systems

"Cathodic protection" is a term used for certain measures taken to prevent or minimize electrolytic corrosion (rust) of metallic equipment and structures. Cathodic protection devices redirect current to flow from a "sacrificial" anode to the soils-water electrolyte, instead of from an anode area on a pipeline or other metallic structure to be protected. Doing this helps to extend the length of new and existing offshore platform assets.

Prior to beginning work on equipment protected by an impressed current Cathodic protection system, which uses high current (as much as 400 amps), a competent and authorized person should first determine whether the impressed current protection system on electrical equipment should remain on or off.

Platform Cabling

These safety guidelines should be followed when performing platform cabling:

-)] Platform electric cables should be checked regularly by an authorized electrician.
-)] Temporary splices should never be made to damaged cables.
-)] Cabling on cable trays should be supported and secured with stainless steel straps or plastic tie wraps fire rated for the location.
-)] Holes made through watertight bulkheads for cabling should be closed with the correct transit blocks and/or glands.

Portable Hand and Power Tools

Do the following when working with portable hand tools and equipment:

-)] Ensure tools are not defective and are in good working condition.
-)] Power tools should be used only for their intended purposes.
-)] Verify unmodified guards are on all power tools and equipment.
-)] Verify that all portable electric hand tools and equipment are:
 - o equipped with a 3-pronged electrical connection
 - o double insulated
 - o used in conjunction with a Ground Fault Circuit Interrupter (GFCI)
 - o All hand-held power tools, such as drills, grinders, needle guns, etc., should be equipped with a constant pressure on/off control switch that automatically turns off the equipment/tool whenever the control switch is released.
-)] Portable tools with locking on/off control switch capabilities must never be used.
-)] Use cold cutting tools, not electric hand tools, in areas where flammable liquids and/or gas may still be behind pipe or released to atmosphere.

Batteries

Batteries store sulfuric acid electrolytes and electrical energy that may cause an explosion and personal injury if suddenly released.

When working with batteries:

- J Cover batteries stored in boxes as sources of emergency power with a non-conductive rubber mat under the lid of the box.
- J Fit battery boxes with vents directed away from air inlets and sources of ignition.
- J During the change out of batteries, avoid naked flames and sparks in the immediate vicinity of the battery.
- J Chock batteries in their storage boxes to prevent movement under tow.
- J Do not lift batteries by their terminals.
- J Have plenty of ventilation, wear all required protective clothing and eyewear, remove jewelry, and exercise caution.
- J Specialty or non-conductive tools should be considered when performing maintenance on batteries.
- J Follow the manufacturer's instructions for testing, jumping, installing, and charging all batteries.
- J Only use spirit (alcohol) thermometers when measuring a battery's temperature.
- J All lead acid, NiCad, and lithium batteries should be disposed of in accordance with all local, state, and federal regulations. Recycle these batteries as universal waste under the company's waste management plan.

Tie-Ins to Company Equipment

Written permission from a company representative should first be obtained before contractors are permitted to tie into existing company facilities, including pipelines, electrical power circuits, and all other equipment.

Extension and Cheater Cords

Power tools and portable electrical test equipment may or may not be rated for use in classified areas. They are equipped with standard non-explosion-proof plug ends, making it sometimes necessary to use an extension cord when plugging into explosion-proof receptacles.

Due to the hazard of arcing electrical equipment or connections when plugging in this equipment, use the following practices:

-) Use only electrical equipment that is approved for use in a classified area.
-) Make sure a Hot Work Permit has been issued and the atmosphere has been tested to ensure flammable, gas-free conditions.
-) Connections should be taped to prevent them from separating.
-) Connections made with explosion-proof ends should be made outside of the classified areas.
-) The last connection made should always be plugging the cheater cord into the explosion-proof receptacle.
-) Break the connection at the explosion proof receptacle first when the job is completed.
-) Remove from service and destroy extension cords that are frayed, taped, or otherwise damaged.
-) Use extension cords only for temporary situations.

Mobile Phone/Personal Electronic Device Use

When using mobile phones or Personal Electronic Devices (PEDs) including cell phones, pagers, cameras, and CD/mp3/iPod players, be sure to use the following practices:

-) When arriving on the platform, report mobile phones and PEDs to the person in charge.
-) Never use these types of equipment outside of living quarters, except in PPE-free zones.
-) During helicopter flights, turn off mobile phones, portable electronic devices, and radio transmitting devices.

- J Obtain a Hot Work Permit for camera use in classified areas.

Module 1 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. Which of the following electrical components is most directly responsible for injury or death?**
 - a. Voltage
 - b. Current
 - c. Direction
 - d. Frequency

- 2. Which of the following should be complied with when installing, repairing, and maintaining electrical equipment on offshore platforms?**
 - a. Only competent and authorized employees should perform work on electrical equipment
 - b. Only use NSMS-approved procedures and practices
 - c. Post First/Aid posters on high voltage equipment
 - d. Splice electrical cords using approved methods

- 3. Which of these guidelines should be followed when performing platform cabling?**
 - a. Cable fuses may be bridged with metal conductors when necessary
 - b. Approved platform metal cable connectors may be used for cabling work
 - c. Platform electric cables should be checked regularly by an authorized electrician
 - d. Work on live electrical cable circuits under 120 vac is approved

- 4. Which of these guidelines should be followed when working with hand tools and equipment on offshore platforms?**
 - a. Use of personal tools with locking devices is allowed in certain circumstances
 - b. Ensure power tool guards have been modified using approved methods
 - c. Make sure power tools are connected with two-prong plugs
 - d. Never use portable tools with locking on/off control switches

- 5. Which of these guidelines should be followed when working with batteries on offshore platforms?**
- a. Ensure battery box vents are directed toward air inlets
 - b. Specialty or non-conductive tools should be considered when performing maintenance on batteries
 - c. Follow OSHA rules when testing, jumping, installing, and charging batteries
 - d. Use only approved electrical thermometers when measuring battery temperature

Module 2: Hazardous Energy Control (Lockout/Tagout)

Hazardous Energy Sources

Energy sources, including electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other sources in machines and equipment, can be hazardous to workers.

During the servicing and maintenance of machines and equipment, the unexpected startup or release of stored energy could cause injury to employees. Therefore, procedures to lock and/or tagout energy sources are very important.

Lockout/Tagout of Equipment

Proper lockout/tagout (LOTO) practices and procedures should always be used to protect workers from the release of any source of electrical, high-pressure, tension, kinetic, mechanical, hydraulic, pneumatic, chemical, thermal, or other hazardous energy. For more information see 29 CFR 1910.147.

When using lockout/tagout procedures, be sure to:

-) Use an approved lockout/tagout device when performing maintenance or repair work on equipment to ensure all equipment is in a zero energy state (cold and dead).
-) Locks should never be removed by anyone but the owner of the lock without the approval of an authorized company representative.
-) Use a secure lock and chain or double block and bleed systems to valves if an accidental opening or closing could create a hazard to workers.
-) Verify Lockout devices are correctly attached and cycle off/on switches to verify that the equipment is properly locked-out before starting work.
-) Only a combination lock with identification tag is allowed to ensure an effective lockout.
-) In addition to lockout devices, place 'Do Not Operate' tags on all necessary valves and engagement devices used in the isolating or locking out of equipment.
-) Activate the proper blocking, braking, and securing devices of all equipment when servicing or repairing electrical, rotating equipment, and/or auxiliary power.

Equipment and Piping Isolation

When isolating equipment and piping, be sure to:

- J Isolation should be in place and proven effective before work begins and remain in place during the work activities.
- J Properly isolate, release pressure, and de-energize equipment and associated piping before any work is done.
- J Use lockout and tagout as appropriate and use of safety blinds and/or valves to secure piping associated with serviced equipment.
- J A work permit should be issued before starting the work after breaking the integrity of piping or equipment.
- J Use safety equipment, such as fire extinguishers and respiratory protection, if there is potential to expose the worker to hazardous substances.
- J Isolate the piping in accordance with current regulations and company practices when breaking the integrity of hazardous or harmful piping under pressure.
- J Use approved blinds or blanks, a double block and bleed method, or another alternate means of isolation that provides adequate protection to workers.
- J Lock and tag valves with “Do Not Operate”, and clearly mark all blinds and blanks.
- J When safety blinds are installed, keep a record of blind number, location, size, and pressure rating and blinds.
- J Correctly pressure rate gaskets for their specific service.
- J Install gaskets used in conjunction with blinds where possible, on both sides of the blind.
- J Keep a record of the location and position valves left in for isolation, for example, open or closed.

- J Check the isolation log to verify that all blinds have been removed and that all valves have been put back to normal operating position before removing locks, blinds or valves.
- J Disconnect, blind, or isolate all associated piping using the double block and bleed method when isolating equipment for confined space entry.

Hoses and Piping under Pressure

Hoses and pipes under pressure are very hazardous and care must be taken when working with them. It's important to understand how pressure is measured.

Gauges on platforms are usually calibrated to read zero pressure at sea level. Gauges measure pressure in pounds per square inch gauge (psig)- the force in pounds of pressure per square inch on a surface relative to atmospheric pressure. When you read 40 psig on a gauge, the actual or "absolute" pressure (psia) which is the pressure relative to a zero-pressure environment (outer space) would be 14.7 psi greater or 54.7 psia.

When using temporary hoses and piping under pressure, ensure the following:

- J Secure temporary hose, piping, and/or associated connections operating under pressure. This will help prevent workers from falling or moving objects while disconnecting.
- J All temporary hoses, piping, and/or associated connections operating at a working pressure of 290 psig or more should be designed and used according to manufacturer specifications or certified by a professional engineer.
- J Establish a safe work zone and post warning signs before temporary hoses and piping are pressurized to 290 psig or more.
- J No workers should enter a danger zone while hoses or piping are under pressure unless allowed to do so by a supervisor or authorized representative.

Hot Tapping

Hot tapping is a method used to make a connection to an existing piping or pressure vessels without interrupting or emptying that section of the piping or vessel. Do the following when conducting hot tap operations:

-)] Hot tapping is not permitted without the written consent of a company Representative.
-)] Prior to hot tapping, workers performing the hot tap should review the contractor/company Hot Tapping and In-service Welding standard.
-)] Hot tap procedures should comply with applicable company and governmental regulations.

Air Hoses and Compressed Air

Compressed air should not be used to clean clothing or equipment with small or loose parts.

Using compressed air is not permitted in the following situations:

-)] As a carrier agent for solvents while cleaning equipment.
-)] For pressure testing vessels or pipelines, unless specifically approved by a company Representative(s) and the Safety Department.
-)] When any soft line air hoses are in use at pressures over 15 psig, use a securing system over the hose connections.
-)] To ensure that whip-check securing systems are used correctly and are properly fitted, follow manufacturer specifications. Homemade and/or uncertified securing systems should not be acceptable.
-)] Do not use worm gear type hose clamps on offshore facilities.

Air-operated Equipment

Compressed air is dangerous. When using air-operated equipment:

-)] Make sure pneumatic power tools are in good working condition.
-)] Use only proper connectors, fittings, and hoses.
-)] Bleed off air pressure before disconnecting the air hose.
-)] Make sure lubricators and water traps are in good working order.

-) Drain air tanks daily of any accumulated water.
-) Never install valves between a tank, compressor, or other equipment and its relief valve.
-) To limit the pressure and flow, regulate compressed air used for cleaning purposes to 30psi.
-) Make sure regulators are adjusted to the recommended air operating pressure.
-) Never configure pneumatic power tools such that they may remain in a locked-on position.

Other General Hose Types

Soft Line and Hydraulic Hoses

-) Use a securing system over connection points when using any soft line hose on boiler systems operating at a pressure greater than 15 psig including a soft line connected to steel piping.
-) Use a 'whip-check' securing system over the connection points when using any soft line hose over 6.5 feet in length on hydraulic systems operating at a pressure greater than 100 psig-this includes soft line hoses connected to steel piping.

[See a short video on Whip checks](#)

-) Make sure all hydraulic hoses, including new and repaired hoses, and those being fabricated on site, are integrity tested.
-) Check all hoses for appropriate pressure ratings and that they are suitable for the intended service or product.

Pigging and Pressure Testing

Pigging refers to using devices called "pigs" to perform maintenance on a pipeline without stopping the flow of the product.

When pigging and pressure testing:

-) Develop safe procedures prior to the start of work related to pigging and testing.

- J A competent and authorized person should verify that the line and/or pig trap (launcher) is depressurized before removing a test head or the opening of a pig launcher or receiver.
- J During pigging or testing operations, only workers directly involved with the work should be in the immediate work zone.
- J When the pipe or pig launcher or receiver is under pressure, post warning signs and do not allow workers in work zone of either end of the pipe.

Module 2 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. All the following are considered hazardous forms of energy on offshore platforms, except _____.**
 - a. thermal energy
 - b. dark energy
 - c. chemical energy
 - d. pneumatic

- 2. Which of the following procedures is necessary when servicing or maintaining machines and equipment on offshore platforms to prevent an unexpected startup or release of harmful energy?**
 - a. Confined Space Electrical Check
 - b. Job Safety Analysis
 - c. Lockout/Tagout
 - d. Hot Work Permit

- 3. Lockout/Tagout procedures should be used when servicing or maintaining machines and equipment on offshore platforms to prevent an unexpected startup or release of harmful _____ energy.**
 - a. emotional
 - b. solar
 - c. wave
 - d. mechanical

4. In addition to lockout devices used in isolating equipment on offshore platforms, which of the following actions should be taken?

- a. Place 'Do Not Operate' tags on all necessary valves and engagement devices
- b. Notify BSEE that equipment is being isolated
- c. Wrap plastic straps around valves and switches
- d. Place tags with operator identity on valves

5. Compressed air _____ to clean clothing or equipment with small or loose parts.

- a. should always be used
- b. may be used
- c. can be used when authorized
- d. must never be used

Module 3: Tools and Equipment Safety

Equipment Guarding

To provide proper safety, all machinery or equipment with moving parts that present a hazard to employees working in proximity to the moving parts or equipment should be equipped with machine guards.

-) Before removing guards, use a lockout/tagout process to determine and isolate all energy isolation devices.
-) Properly guard and insulate, when required, all piping and exhausts that could cause burns.
-) Never remove guards on portable tools.
-) Replace removed guards before the machinery is returned to operation.

When working with machinery guards, use the following precautions:

-) Before any equipment is put in service, the worker in charge verifies that all machinery guards are in place.
-) Keep machinery guards in place at all times when the equipment is in operation.
-) Post a sign or erect a barricade before removing a guard.
-) Equipment should not be run without guards unless an approved Management of Change (MOC) process is in place.

Abrasive Wheel Grinders

Abrasive wheel grinders come in many styles, sizes, and designs. Typical bench and pedestal grinders often have two abrasive wheels, or one abrasive wheel and one special-purpose wheel such as a wire brush, a buffing wheel, or a sandstone wheel.

These grinders come with a safety guard covering most of the wheel, including the spindle end, nut, and flange projection. The guards must be strong enough to withstand the effects of a shattered wheel. A work rest and transparent shields are often included.

When using bench grinders:

-) Grinders should have a protective guard and a properly adjusted tool rest with a gap within 1/8 inch between the grinding disc and the rest.
-) The adjustable tongue guard on the top side of the grinder should be within 1/4 inch of the wheel.
-) Ring test the abrasive wheel before they are mounted to ensure that they are free from cracks or other defects. Wheels should be tapped gently with a light, nonmetallic instrument. A stable and undamaged wheel will give a clear metallic tone or “ring.”
-) Employees using grinders should wear goggles and full-face shields. Keep these properly positioned near the bench grinder for ease of use.
-) Locate an on/off switch (preferably a dead-man’s switch) within reach of the person using the bench grinder.
-) Only trained and competent workers should change grinding discs.
-) The RPM rating of the grinding disk should match, or be greater than, that of the grinder rated RPM.
-) Grinders should never be used to grind wood, plastics, or aluminum.

Tool Use

-) Only competent and properly trained workers should operate power tools.
-) Use tools only for their proper function and keep them in good condition.
-) Do not use defective or altered tools.
-) Operators should visually inspect equipment and verify it is in safe operating condition before starting work.
-) Disconnect the power source from a tool and/or depressurize before adjusting the tool.
-) Properly fit guards and verify good condition at all times.

- J Label grinders and grinding discs to indicate maximum RPM and check for correct size and speed prior to fitting.
- J Wear appropriate personal protective equipment at all times when using any tools.
- J Use only ANSI approved properly grounded electrical tools with 3-pronged plugs or double insulation or ground fault insulation.
- J Do not use switch lock-on devices with any electrical or air-powered tools.
- J Explosive-actuated fastening tools should meet all requirements of the current NFPA 70 and be used only by trained, competent workers.
- J Before using electric tools in potentially flammable atmospheres, issue a Hot Work Permit and conduct suitable testing. Complete documentation that:
 - o indicates whether the atmosphere contains a flammable substance in a quantity sufficient to create an explosive atmosphere
 - o confirms work may be safely performed

Contractor Use of Company Equipment

When using company equipment:

- J Contract workers should not operate any switches, valves, or controls on company equipment unless specifically authorized to do so by the company representative.
- J Contractors should not tie in to existing company facilities including pipelines, sewer system, electrical power circuits, or any other equipment, without specific approval from a company representative.
- J Contractors should install blinds, locks and other safeguards only if they meet company standards and are approved by the company representative.
- J Once approved tie-ins have been made to existing company equipment, the entire system should be considered company property for the duration of the work being conducted.

Module 3 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. Before removing machine guards, which of the following actions should be taken to determine and isolate all energy isolation devices?**
 - a. Post a machine guard watch
 - b. Test mechanical linkages to ensure they are removed
 - c. Perform lockout/tagout procedures
 - d. Display a warning sign by each energy isolation device

- 2. On a grinder, what is the approved tool rest gap between the grinding disc and the tool rest?**
 - a. About 1/4 inch
 - b. Within 1/8th inch
 - c. Less than 1/2 inch
 - d. Less than 1/16th inch

- 3. Which of the following is an ANSI-approved method for grounding plugs on electrical tools?**
 - a. Single insulation
 - b. Grounded insulation
 - c. 2-pronged plugs
 - d. 3-pronged plugs

- 4. Which of the following is a method to ensure abrasive wheels on grinders are free from cracks or other defects?**
 - a. Ring test
 - b. Drop test
 - c. Spin test
 - d. Sound test

- 5. Contractors should install blinds, locks and other safeguards only if they meet company standards and are approved by ____.**
- a. the contractor's safety officer
 - b. the onboard safety officer
 - c. the BSEE representative
 - d. the company representative

Module 4: Crane Operator Qualifications and Best Practices

Moving large, heavy loads is crucial to today's oil and gas industry. A lot of has been developed for these operations, including careful training and extensive workplace precautions. There are significant safety issues to be considered, both for the operators of the diverse "lifting" devices, and for workers in proximity to them.

Crane Operator and Rigger Qualifications

The qualifications of crane operators and riggers should follow the API RP 2D standard, including:

-) Each crane operator should be designated as authorized in writing by a competent/authorized company representative.
-) A list containing the names of authorized crane operators should be maintained by the company on all manned platforms.
-) Only designated and authorized workers should be allowed to operate the cranes.
-) Crane operator trainees should operate cranes only under the direct supervision of a competent/qualified operator.
-) Crane riggers should have written certification verifying completion of a recognized crane rigging course as detailed in API RP 2D.

Crane Operation Best Practices

When operating cranes:

-) Always verify that the status of each of the following items is documented, and that each item is in place and in compliance at the beginning of the crane inspection:
 - o crane controls
 - o capacity chart
 - o properly marked controls
 - o operational boom angle indicator
 - o hand signal charts

- operational limit switches
 - wire rope condition, by a visual inspection
 - sling and cable condition, by a visual inspection
 - boom condition
 - hook safety latches
 - fluid levels
- J Take the crane out of service if operational limit switches are not functional. The crane should not return to service until properly repaired.
- J Never leave the crane unattended with a suspended load.
- J Use 2-part shackles with cranes when conducting normal deck operations.
- J Operate cranes within their rated load capacities as specified by the load capacity chart.
- J Do not use cranes to slide or snake the load by pulling from the side with the crane boom.
- J Use tag lines to control the load.
- J Use Shepherd Hooks to retrieve tag lines.
- J Use a 'Hands-Free' practice when handling loads.
- J Do not place yourself under a suspended load.
- J Deck crews should establish an avenue of escape to avoid pinch points.
- J Paint crane blocks and crane balls safety yellow or orange.
- J Know the weight of every load lifted with the crane.
- J Do not ride the crane block, suspended loads, boom, or hooks.
- J Position crane booms so that there is no possibility of interference with helicopter operations.

-)] Stand outside of the cab so that the helicopter pilot can see you.
-)] Do not operate cranes in adverse weather conditions.
-)] Make workers aware of the crane load's 'fall zone' area.
-)] Keep the fall zone area clear of workers not associated with a lift in process.
-)] Lay the crane boom in the boom rest for maintenance.
-)] Never override crane safety limit switches.
-)] Transfer workers by crane only if a certified operator is controlling the transfer, the crane is outfitted with an anti-two block device, and a proper workers basket is used.

Weather Stops for Crane Operations

Weather conditions exceeding the limits discussed below can result in injury or property damage when performing a lift and crane operations should stop.

The crane operator and boat captain are the persons who decide whether to make a lift.

Follow these general guidelines for Stops for Crane Operations:

-)] When stopping crane operations, a Stop Work Authority (SWA) should be used if the situation is deemed unsafe to proceed due to changing conditions.
-)] Crane operations should stop even if everyone has agreed that they may proceed.

Crane Operations should be stopped under the conditions shown in the following table.

Weather and Sea Conditions that Stop Crane Operations	Operations Stopped
Seas meet or exceed 12 feet	All Dynamic Crane Operations
Winds meet or exceed 35 mph	All Crane Operations, Static and Dynamic
Lightning in the vicinity	All Crane Operations, Static and Dynamic

Crane Assisted Personnel Transfers

When conducting crane assisted personnel transfer net devices, employees should follow these minimum lifting practices recommendations:

-) Develop a written procedure for transferring workers on offshore facilities with a worker carrier.
-) Conduct worker transfer training prior to going offshore.
-) Conduct a pre-use inspection of the transfer basket prior to making any workers transfer.
-) Ensure cranes assigned to worker lifting duties are suitable for this purpose.
-) Crane operators assigned to worker lifting duties should be certified and competent to perform this task.
-) Worker carriers may not be used in weather, wind, or sea conditions that the qualified crane person considers unsafe.
-) Attach a snag-resistant tag line to all worker carriers.
-) Crane hooks used for worker transfers should have a positive locking latch.

- J Use only approved worker carriers for lifting workers per API RP 2D.
- J Do not use workers carriers as a workbasket or cargo net.
- J Legibly mark workers carriers with the maximum number of passengers.
- J Do not transfer luggage in the center of the workers net.
- J Be careful leaning over to get bags, especially in rough seas.
- J Before any attempt is made to lift workers with a carrier, give clear instructions to all persons involved.
- J Do not transport workers suffering from acute seasickness or vertigo.
- J Any person may refuse transfer by a workers basket.
- J Persons riding on a worker carrier should wear an approved Type I Personal Floatation Device (PFD) for all transfers.
- J Personnel riding on a workers carrier should stand on the outer rim, evenly spaced, and adjacent to a sidewall opening in the netting, facing inward. Passengers interlock forearms to the inside of the sidewall netting.
- J If crane operator's view of the primary signalman is obstructed, the workers carrier should not be moved until alternative communication or signal devices are placed in service.
- J A designated primary landing zone should be marked in a safe area as determined by a JSA.
- J Lift the worker carrier only high enough to clear obstructions and gently lower it to the deck.
- J Do not raise or lower a loaded worker carrier directly over a vessel.
- J The crane operator may refuse to lift any person who does not comply with the operator's instructions.

- J An experienced escort should attend to persons who are not confident performing a workers carrier transfer.
- J Injured, ill, or unconfident persons may ride in a sitting position.

Module 4 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. What action should be taken if an operational limit switch on crane is not functional?**
 - a. Notify the safety officer
 - b. Take the crane out of service
 - c. Post a warning tag on the limit switch
 - d. Replace the switch when work is completed

- 2. When operating a crane, which method should be used to control the load?**
 - a. Harnesses
 - b. Warning barriers
 - c. Shackles
 - d. Tag lines

- 3. Under which of the following weather conditions should all crane operations be stopped?**
 - a. Winds meet or exceed 35 mph
 - b. Seas meet or exceed 35 feet
 - c. Seas meet or exceed 20 feet
 - d. Winds meet or exceed 12 knots

- 4. Which of the following actions should be taken prior to making any crane-assisted workers transfer?**
 - a. Check to make sure the crane operator is on board.
 - b. Complete a worker transfer form
 - c. Check with the onboard safety officer
 - d. Conduct a pre-use inspection of the transfer basket

- 5. Personnel should stand on the outer rim, evenly spaced, and adjacent to a sidewall opening in the netting, facing inward during which of the following procedures?**
- a. fishing from the side of the platform
 - b. being lifted to an elevated work area by a crane
 - c. riding on a workers carrier
 - d. working at the top of a process tank

Module 5: Control of Hazardous Chemicals and Substances

Handling Hazardous Chemicals and Substances

When working with chemicals, products, and materials:

-) Follow all HAZCOM required standards when handling hazardous substances.
-) Safety Data Sheets (SDS) provide vital safety information on chemical products used at the worksite. SDS should be provided for all substances. They should also be present at the chemical storage locations and consulted before using.
-) Maintain a complete set of SDS to ensure they are available for ready reference.
-) Chemicals or other hazardous material should not be accepted on any facility without a current SDS for the relevant product.
-) Hazardous substances received should be checked to ensure that all packaging is intact; with no leakage of the contents and package labeling that is consistent with the SDS.
-) Place chemicals and hazardous substances in the appropriate hazardous storage area for the particular substance.
-) Store containers with chemicals and hazardous materials in liquid form in suitable storage areas.
-) Before using any hazardous substance, the workers using the substance should understand the instructions on its use and precautions to be taken.
-) Adequate personal protective equipment should be available and used as required.
-) The supervisor should assess the job to be performed and if required, conduct training sessions and a Pre-Job Safety Meeting with all workers involved in the use of the hazardous substance.
-) Maintain a master file of SDS for all hazardous material in use for reference.

- J Hazardous materials labels or markings on containers in use or stored on platforms or Mobile Offshore Drilling Units (MODU's) that have been damaged, defaced or faded should be replaced.
- J Archive all hazardous chemicals that were present on the facility at any time.
- J SDS should be available for all hazardous chemicals and products on company worksites.
- J Employees should be trained handling chemicals and products safely according to Hazardous Communications (HAZCOM) program requirements.
- J Contractors should have comparable training as required by their HAZCOM program.
- J Safety Data Sheets (SDS) should be available to all affected employees and contractors exposed to hazardous substances.
- J The designated location of SDS's is communicated during orientation. The SDS's should be stored in the central work area so that workers have immediate access in an emergency.
- J Verify that the appropriate placard markings and cargo manifests are in place at the platform. Damaged or faded placard markings should be replaced.
- J Prior approval is required before bringing a new chemical or controlled product to a company site.

More information on OSHA's new [GHS Hazard Communication Standard](#).

Hazardous Waste Operations and Emergency Response (HAZWOPER)

Emergencies can create a variety of hazards for workers in the impacted area. Preparing before an emergency incident plays a vital role in ensuring that employers and workers on offshore oil and gas platforms have the necessary equipment, know where to go, and know how to keep themselves safe when an emergency occurs.

HAZWOPER refers to the types of hazardous waste operations conducted in the United States under OSHA Standard 1910.120 "Hazardous Waste Operations and Emergency Response."

The standard contains the safety requirements employers should meet in order to conduct these operations.

Workers may need to attend 8-hour, 24-hour, or 40-hour HAZWOPER training prior to authorization as an emergency responder.

Changing Oil/Service Equipment

Properly collect, store, transfer, and dispose of waste products generated by the servicing of equipment.

Asbestos

Asbestos is well recognized as a health hazard and its use is now highly regulated by both OSHA and EPA. Asbestos fibers associated with these health risks are too small to be seen with the naked eye. Breathing asbestos fibers can cause a buildup of scar-like tissue in the lungs called asbestosis and result in loss of lung function that often progresses to disability and death. It's important to know that there is no "safe" level of asbestos exposure.

Many people have come into contact with asbestos fibers through their jobs (occupational exposure). Some of the work environments or occupations in which workers are now or were exposed in the past include:



Work Environments

-) construction sites
-) maritime operations
-) mining operations
-) offshore rust removals
-) oil refineries
-) power plants
-) shipyards / ships / shipbuilders

When working with asbestos:

-) Locations containing asbestos should be designated as “regulated” areas.
-) Remove asbestos in compliance with applicable regulations.
-) Verify that workers removing the asbestos are adequately trained and qualified.
-) Do not allow drinking, eating, or smoking in regulated areas.
-) Ensure workers use proper personal protective equipment (PPE)
-) Properly prepare, handle, and transport asbestos-containing clothing after use.

Visit [Safety and Health Topics - Asbestos](#) for more information on asbestos safety.

Radioactive Materials and Equipment

Radiation may be defined as energy traveling through space. All forms of ionizing radiation have sufficient energy to ionize atoms that may destabilize molecules within cells and lead to tissue damage.

Ionizing radiation sources may be found in a wide range of occupational settings in various manufacturing settings including the oil and gas industry. If radiation is not properly controlled it can be potentially hazardous to the health of workers.

When handling radioactive materials and equipment:

-) Store it in a dedicated storage area with the appropriate signage.
-) Only qualified and experienced third-party workers should handle and use radioactive materials under a Work Authorization Permit. Strict rules govern the handling of radioactive material and should be followed at all times.
-) Prior to handling radioactive materials and equipment, a PA announcement should be made warning workers of their use and the areas in which they will be used. Restrict area access during use.
-) The third-party company using radioactive material should supply the company representative with a complete set of rules and regulations governing the use of the material and the contact information for the Radioactive Supervisor.

More information on [ionizing radiation hazards](#).

Radiographic Inspections - Non-Destructive Testing (NDT)

Radiographic inspection is a form of nondestructive testing that checks for holes, voids, and discontinuities in welds, etc., using electromagnetic radiation to penetrate metals.

There is potential for workers to be exposed to radioactive source hazards when conducting radiographic inspections due to the use of x-ray emitting devices and/or laser equipment as part of the inspection process.

When radiographic inspections are being conducted, follow the safe work practices below:

-) The contractor should be certified and approved to use radiographic devices.
-) Conducting these inspections verifies that work is being conducted using equipment that is licensed and approved in accordance with applicable regulations.
-) The inspection process should have a written procedure outlining safe work practices associated with inspection activities.

- J Schedule the inspection only when a minimum number of workers are in the testing vicinity.
- J Identified radiographic testing areas should be designated as Restricted/High-hazard areas. Rope off or barricade these areas.
- J Place warning signs in visible locations around the testing area and keep warning signs in place until the testing activity has been completed.

Watch this short video on [Basic NDT Methods](#).

Painting and Coatings

Paints and coatings are considered hazardous substances. On all offshore facilities, be sure to follow best management practices for abrasive blasting and coating operations.

Be sure to following the best practices below when using paint or coatings:

- J Paints are considered hazardous substances and should be stored in their original container.
- J Dispense small quantities of paint to tins for paint jobs.
- J Return any residual paint to the original paint container.
- J Store paint in the paint locker and keep it closed at all times.
- J Keep the paint inventory neat.
- J Secure container lids when finished using the paint.
- J Follow the protocol below when working with paint thinners:
 - o Handle paint thinners with the same protocol as paint.
 - o Do not use paint thinners for cleaning anything other than paintbrushes.
 - o Dispose of used thinners correctly. Do not throw the thinners into the sea.

-) All paint should be handled and disposed of in accordance with company's Waste Management Plan.

Abrasive Blasting

Abrasive blasting is the most common surface preparation technique used to remove old paint and other surface materials such as rust, mill scale, dirt, and salts. Abrasive blasting might be conducted during vessel and during maintenance and repair operations that include blasting and painting.

Workers who engage in abrasive blasting are at an increased risk of exposure to toxic dusts, high noise levels, and a range of other safety and health hazards. Helpers (e.g., the "pot tender" and cleanup personnel) and others may also be at risk if they work in the vicinity of areas where abrasive blasting is conducted.

Be sure to follow the best practices below when abrasive blasting is conducted:

-) Use vacuums equipped with High Efficiency Particulate Air (HEPA) filters or wet methods when removing accumulated dust.
-) Schedule blasting when the least number of people would be exposed.
-) Blast in a specified location that is as far away as possible from other employees.
-) Stop other work and clearing people away while blasting is taking place.
-) Clean up paint chips, dust, and used abrasive daily or as soon as possible after blasting has finished.
-) Avoid blasting in windy conditions.
-) Post warning signs to mark the boundaries of work areas contaminated with blasting dust and alerting employees to the hazard and any required PPE.

See a video on [Offshore Painting and Abrasive Blasting Best Management Practices](#).

Gas Detectors (Portable)

When using portable gas detectors:

- J Use and maintenance on portable gas detectors should be performed only by competent persons.
- J Use manufacturer's recommendations, approved calibration kit, and daily bump test when calibrating gas detectors.
- J When used in confined space atmospheric testing, portable gas detectors should have appropriate auxiliary pumps and wands.
- J Before issuing confined space permits or safe welding/burning permits, atmospheric testing or sampling should be performed in a confined space.
- J When working in confined spaces or hot work areas, continuous monitoring of the atmosphere is required. Documentation is required at 15 min intervals.
- J Portable gas detectors should be calibrated using an external service provider at least every 90 days. Ensure a current inspection sticker (with date) is attached.

Module 5 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. Which of the following provides vital safety information on chemical products used at the worksite?**
 - a. Safety Data Sheet (SDS)
 - b. Hot Work Permit (HWP)
 - c. Job Safety Analysis (JSA)
 - d. OSHA Report 300

- 2. Damaged labels or markings that have been defaced, damaged, or faded on hazardous materials containers or Mobile Offshore Drilling Units (MODU's) ____.**
 - a. should be repaired
 - b. should be replaced
 - c. should be covered
 - d. moved to the back

- 3. Safety Data Sheets (SDS's) should be stored ____ so that workers have immediate access in an emergency.**
 - a. in a locked cabinet
 - b. in the safety office
 - c. in at least three locations
 - d. in the central work area

- 4. Prior to workers handling radioactive materials and equipment ____.**
 - a. a podcast should be developed and viewed
 - b. a walk-around area inspection should be conducted
 - c. a PA warning announcement should be made
 - d. a risk analysis should be performed

5. Portable gas detectors should be calibrated using an external service provider _____.

- a. when it appears the detector is not calibrated
- b. at least every 90 days
- c. weekly
- d. during the annual down-time

Module 6: Material Handling, Rigging and Lifting Safety

It's important for the company to develop a formal Transit Container Code to assist contractors in safe and compliant material handling and shipping. Compliance should be with the [International Maritime Dangerous Goods \(IMDG\)](#) requirements for material handling, cargo operations and lifting equipment.

Material Handling

Use these procedures to assist in handling materials in a safe and less risky environment for workers and equipment:

-) Items shipped offshore that are scheduled to be lifted by a crane should be placed in appropriate containers that have certified rigging pre-installed.
-) If the size of the item is too large to be placed in appropriate containers, make sure the item has approved lifting attachments and certified rigging installed prior to loading.
-) Do not remove the rigging that was used on containers. Rigging should remain with the container and not removed unless it is damaged.

Cargo Loading

When loading cargo:

-) Cargo loaded inside containers for shipment by sea should be secured to prevent any movement during transportation.
-) Be sure that bulky or heavy loads are tied down properly to prevent unsafe movement.
-) Equipment unloaded from supply vessels on the platform should be positioned so that access to the container doors is not blocked.
-) When opening container doors, only open one door at a time and be sure to open them carefully to prevent being injured by loose or falling equipment. Stand to the side of the unopened door.
-) Always have an escape route when positioning and working around containers.

See this video on a [fatality while loading cargo](#).

Slings

When using slings:

-) Wire ropes, cable clamps, shackles, sheaves, and thimbles should be inspected prior to each use.
-) Always be sure to use the correct number of cable clamps.
-) When any damage has occurred to wire rope, discard it and replace it.
-) Prior to each job, check the condition of slings and make sure all slings have a permanent inspection tag affixed and certifications available.
-) Always store slings and wire rope in protected areas.

When issuing and using Fiber/Soft Slings:

-) Canvas or manufactured fiber slings are better than wire rope slings when grip is required on small-diameter surfaces or when minimal damage to machined or soft surfaces is required.
-) Fiber or soft slings should be typically used for specific, not general lifting applications.

All workers engaged in material handling should comply with the following:

-) Always determine the size, weight, and shape of load to be lifted.
-) Consider an alternate means of lifting to determine the use of each sling.
-) Conduct a JSA to determine the correct slings and lifting procedures.

A register for each fiber or soft sling should be maintained on the platform. The register should identify:

-) date the sling entered service
-) identification mark/serial number
-) Swing Weight Limit (SWL)

Take a look at this very informative video: [How to do Rigging and Slings in Offshore Rig.](#)

Rope

On platforms, sisal rope is not recommended for use as it will deteriorate, become brittle, and could break at limits below those expected for the size of rope when it is exposed to the sun.

When using rope:

-) Do not use rope for lifting or securing loads.
-) Rope should only be used as tag lines or securing small lightweight items.

Perforating Guns

A perforating gun is a device fitted with shaped charges or bullets that is lowered to the desired depth in a well and fired to create penetrating holes in casing, cement, and formation.

When perforating guns are being loaded or handled:

-) Barricades should be erected to protect workers from injury.
-) Access to barricaded areas is limited to only authorized persons.
-) Phones and radios may need to be turned off in the area.
-) Never conduct perforating if lightning storms are in the area.
-) Be sure to turn off Cathodic Protection Systems.
-) Warn non-essential workers through the PA system that perforating is being conducted.

Pipe Handling

Follow these lifting policies when handling pipe:

-) Pipe stringing procedures should be discussed with the competent and authorized person prior to the job starting.

-)] Two- and three-inch pipes may be placed on sawhorses and stools, however, four-inch pipe and larger should be placed on skids. Any exceptions should be approved by a company representative.
-)] Pipe should be tied down to prevent the pipe from shifting when transporting.
-)] Avoid standing or walking on pipe.
-)] To control the possibility of rolling pipes and to prevent pipe from falling to ground level or striking nearby workers, tiers of pipe should be properly blocked and secured.
-)] To prevent a possible crush injury, hands and feet should not be used to position pipe.
-)] Walking or working under or near a suspended pipe is forbidden unless the load is fully and properly secured or supported by blocking.
-)] Always use tag lines to control suspended loads.

Ergonomics and Manual Lifting

It is important that workers on oil platforms consider the ergonomics of the job. The need to lift and lower heavy objects, twist, overreach, stoop, or overstretch is common on the rig but should be minimized as much as possible.

Most back injuries are caused by ignoring basic safe lifting rules. Back injuries can be prevented by lifting with the legs, not the back.

Follow the guideline below when lifting:

-)] Assume a squatting position. Keep the object to be lifted close to the body and raise the object by straightening the legs.
-)] Estimate the weight of the object before lifting. If the object is too heavy, be sure to get help.
-)] Make sure your footing is secure.
-)] Keep the back straight when lifting any object, light or heavy.

-)] Take advantage of skids, hoist, bars, jacks, blocking, rollers, or hand trucks when necessary.
-)] Never twist when company lifting or lowering an object.
-)] Limit what is lifted manually to about 50 lbs.

More information may be found in OSHAcademy Courses [711](#) and [722](#).

Lifting Devices

All lifting devices and material hoists should regularly inspected. They should meet BSEE and U.S. Coast Guard requirements and be labeled for maximum lifting capacity.

-)] Lifting devices should be operated only by competent/qualified, authorized workers.
-)] One worker should be designated as a signalman (flagman).
-)] Lifting device operators should take direction from the signalman.
-)] Anyone can give the all-stop signal.
-)] The operator should determine the weight of the object to be lifted prior to performing a lift.
-)] Cables, lifting devices, slings, and wire ropes should be inspected immediately prior to use to make sure they are in proper condition, and positioned to support the weight of the load.
-)] Examine the boom angle to make sure it is appropriate for the load and the expected dynamics of the load.
-)] Develop form lift plans whenever critical lifts, such as heavy lifts, lifts over process equipment, or lifts involving two cranes, are required.
-)] Perform a JSA for lifts where the operator cannot see the load.
-)] Make sure that a signalman is properly positioned to signal the lift when the operator cannot see the load.

- J No person should be positioned such that any part of the body is under the load being lifted by a crane, side boom, or other lifting device.
- J Unbalanced loads or lift materials should never be lifted directly above workers.
- J Never use lifting devices to pull loads sideways.
- J Never leave a suspended load unattended.
- J Leave all the controls in neutral, the brakes locked, and loads lowered to ground level when shutting down a lifting device.
- J Keep loads as close to ground level as possible and use tag lines when hoisting materials.
- J Make sure inspection and maintenance records for each lifting device are available for review by the company representatives.
- J Do not exceed manufacturer safe lifting limits on loads exerted on rigging.
- J Tag rigging equipment for safe working load limit information.
- J Do not use rigging equipment until it is properly tagged or marked with a rating of the equipment for safe workloads.
- J Inspect to verify that running lines of the sling do not contact the shackle bolt.
- J Make sure slings are protected from any cutting edges.
- J Do not shorten legs of a sling using knots and/or bolts.
- J Use shackles to pin the eye of the sling or lifting lugs and do not let pins meet the running part of any sling.
- J Ensure hooks on lifting and rigging equipment have properly functioning safety latches.
- J All the following conditions should be considered when using cranes, pickers or hoisting equipment:

- wind velocity
- temperatures
- reach or extension of lifting equipment
- weight of the load including the rigging being used
- proximity to other workers and equipment

View a video: [Pre-Lift Rigging Inspection](#)

Overhead Work

When completing overhead work:

-) Raise tools and equipment to the overhead work site in a bag or utility belt specifically designed for that purpose.
-) Do not work above other workers unless they are adequately protected by the installation of an overhead barrier.
-) Clearly mark an area when workers could be struck by a falling object. Use barriers, notices, warning lights or other warning devices.
-) Attach drop lanyards to tools to prevent objects from dropping.

Barricades, Flagging, and Signage

When using barricades, flags, or signage:

-) Whenever a temporary hazard exists due to operations or maintenance work, use necessary signs and barricades to warn and protect workers.
-) Ground level barricade devices should be at least 3 feet in height and extend 3 feet past the ends of the hazardous zones.
-) Use flags and descriptive tags to warn workers in work areas.
-) Colored flagging tape can identify worker actions near hazardous areas as follows:

- **Red - 'Do Not Enter'** – use when falling objects or overhead lifts, etc., create hazards. Entry restricted to authorized workers only.
 - **Yellow - 'caution'** – Use as a warning when a hazard exists in the area. Increased hazard awareness is required.
- ⌋ Do not remove flagging tape until the hazard no longer exists and work has been completed.

Swing Rope Transfers

Swing ropes are used to transfer workers from boats to the landing area of the platform. During moderate to heavy seas, using a swing rope can be quite demanding. Be sure to follow all severe weather restriction guidelines.

Follow these guidelines when transferring workers using the swing rope:

- ⌋ Deck hands should always be present to perform swing transfers.
- ⌋ Unless an authorized person approves, transfers should occur only during daylight hours.
- ⌋ Workers should face the boat when it is at a safe position as determined by the Boat Captain.
- ⌋ If seas allow the boat to bump the structure, workers should face where the boat is bumping against the offshore structure.
- ⌋ Use the correct rope for outboard or inboard swings.
- ⌋ Boat or platform landing area lighting must be adequate.

Follow these procedures when transferring:

- ⌋ Make sure both hands and arms free.
- ⌋ Catch the knotted rope when the boat is at top of a swell.
- ⌋ Swing to the structure by pushing off from the boat with your feet.

-) Always keep feet and legs clear of the structure's landing, and do not let the swing rope get between your legs.
-) Wear an appropriate Type I Personal Floatation Device (PFD).
-) Do not carry any items while transferring by swing rope.

Check out this [video on making a swing rope transfer](#).

Tag Lines

Tag lines play an important part in helping to maneuver, control, and position loads being moved by cranes.

When using tag lines:

-) Never tie or wrap tag lines around the hands or bodies of people using them.
-) Do not make knots at the end of the tag lines.
-) Use the length that is appropriate for the lift.

Here is a [short video that demonstrates using a tagline](#).

Module 6 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. Items shipped offshore that are scheduled to be lifted by a crane should be placed in appropriate containers that have _____.**
 - a. certified rigging pre-installed
 - b. attachments for rigging
 - c. approval from BSEE agents
 - d. at least four attachment points

- 2. All workers engaged in material handling should check the load to determine which of the following?**
 - a. Height
 - b. Size
 - c. Color
 - d. Contents

- 3. What should workers do when perforating guns are being loaded or handled?**
 - a. Position warning signs
 - b. Place warning cones to inform workers
 - c. Tell everyone to wear ear plugs
 - d. Erect barricades to protect workers

- 4. When handling pipe, which of the following may be placed on sawhorses and stools?**
 - a. Four inch pipes
 - b. Pipes under five inches in diameter
 - c. Two- and three-inch pipes
 - d. Pipes stamped with BSEE approval

5. What should workers remember when using tag lines?

- a. Tie or wrap tag lines around the hands or bodies to position the load
- b. Use a length that is appropriate for the lift
- c. Always make knots at the ends of the tag lines
- d. Catch the tag line when the boat is at the bottom of a swell

Module 7: Miscellaneous Best Practices

Compressed Gas Cylinders

When using compressed gas cylinders:

- J Return them promptly to a suitable storage area after use.
- J Locate storage areas away from general and emergency escape traffic paths.
- J Divide cylinder storage areas in to areas marked as 'full' and 'empty' by tagging the cylinders.
- J Oxygen cylinders should be stored at least 20 feet away from fuel-gas cylinders or combustible materials (especially oil or grease). As an alternative, a non-combustible barrier, at least five feet high, can be used with a fire-resistance rating of at least one-half hour.
- J Separate cylinders containing substances that, if mixed, could produce an explosive or fire hazard. For example, do not store acetylene and oxygen cylinders together unless they are stored in an approved bottle-rack carrier, per NFPA Standard 55.
- J When not in use, close cylinder valves and depressurize connecting hoses.
- J Be sure that valve protection caps are in place on cylinders whenever they are not connected for use or while they are being transported.
- J Store, transport, and use compressed gas cylinders in accordance with manufacturer's specifications and NFPA codes
- J Secure cylinders to substantial stationary objects or structures by a chain or other suitable means capable of supporting the weight of the cylinder.

Compressors, Engines, and Pumps

When working with compressors, engines, and pumps:

- J The equipment may start automatically, without warning. Personnel should stay away and refrain from leaning on or resting anything against the equipment. Post warning signs on the equipment.

- J Some parts of air compressors may become extremely hot during use. Mark these places on the machine to warn workers who may come into accidental contact with it.
- J Fit rotating parts of pumps, engines, and other machinery, such as fans, belts, chain drives, and clutches, with machinery guards. Do not remove safety guards on compressors except when inspecting, making repairs, lubrication, or making adjustments. Replace these parts immediately.
- J Do not perform work until power has been shut off, the machinery properly locked and/or tagged out, and any Work Authorization Permits and/or Isolation Certificates have been issued.
- J All compressors, engines, and pumps should have all required safety devices installed as per API RP 14C and manufacturer's recommendations.

Confined Spaces

It is important that all workers understand safety requirements associated with operations conducted in confined spaces.

Confined space entry can be extremely dangerous. Company and contractor workers are not authorized to conduct confined space entries without proper training and authorization.

OSHA considers workplaces confined when their configurations hinder the activities of employees who should enter, work in, and exit them.

- J On offshore facilities, a confined space:
 - o has limited or restricted means for entry or exit
 - o is not designed for continuous employee occupancy
- J Where a worker should enter a confined space, verify that suitable confined entry procedures are in place, proper personal protective equipment and testing equipment is used, to protect and that workers have received the proper training.
- J Documentation of this training should be provided to company prior to the job.
- J Make the required Confined Space Entry Plan and Permit readily available at the work site.

For more information on this topic, take OSHAcademy [Course 713, Confined Space Safety](#).

Dropped Objects and Equipment

When objects are dropped:

-)] Notify the company representative and/or the supervisor of any dropped objects whether on- or overboard.
-)] Record objects that are lost overboard on the facility's daily operations report and investigate incidents, as appropriate.
-)] Report all dropped objects to company representative as well as HSE manager to ensure they are externally reported as per BSEE regulations.
-)] Adhere to all industry best practices for dropped objects prevention guidelines.

Helicopter Safety

When riding helicopters, passengers should:

-)] Be properly oriented and trained on passenger safety.
-)] Closely follow boarding and disembarkation safety instructions given by the helicopter representative.
-)] Be aware of the location of exits and safety equipment when boarding.
-)] Always enter or leave the helicopter in the safe access/egress area.
-)] Secure lightweight articles to prevent them from being sucked into the rotor blades or blown overboard.
-)] Wear seatbelts, ear protection, and life jackets during the flight.
-)] Do not tamper with any helicopter equipment.
-)] Carry only one piece of luggage from the helideck at any one time.
-)] Always keep one hand on the handrail.

Module 7 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

- 1. Oxygen cylinders in storage should be separated from fuel-gas cylinders or combustible materials a minimum distance of ____.**
 - a. 20 feet
 - b. 5 feet
 - c. 15 feet
 - d. 25 feet

- 2. What should workers do with cylinders containing substances that, if mixed, could produce an explosive or fire hazard?**
 - a. Document the location of the cylinders
 - b. Separate the cylinders
 - c. Ensure cylinders are chained together
 - d. Lay cylinders on their sides

- 3. Workers should NOT remove safety guards on compressors when doing which of the following?**
 - a. Inspecting equipment and machinery
 - b. Making repairs to equipment
 - c. Lubricating equipment
 - d. Conducting normal operations

- 4. Workers should make sure rotating parts of pumps, engines, and other machinery, such as fans, belts, chain drives, and clutches, are fitted with ____.**
 - a. OSHA labels
 - b. Safety Data Sheets
 - c. machine safety guards
 - d. proper color codes

- 5. On offshore facilities, a confined space is configured such that it ____.**
- a. contains accommodations for continuous occupancy
 - b. has limited or restricted means for entry or exit
 - c. is limited to two or less worker occupancy
 - d. has only one exit with steps

Endnotes

1. Health and Safety Executive. (2014). Offshore Oil and Gas. Retrieved from: www.hse.gov.uk/offshore/index.htm
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5. Occupational Safety and Health Administration (2014). Oil and Gas Extraction. Retrieved from: www.osha.gov/SLTC/oilgaswelldrilling/otherresources.html
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