Oil and gas industry workers engage in many activities that may expose them to serious hazards, such as falling from towers, unguarded machinery, being struck by heavy equipment, electrocutions, and silica dust. The information, tools, and resources provided in course are designed to help you, whether you are an employer or employee, to identify, reduce, and eliminate oil and gas-related hazards. This course is also an introduction to the basic elements of an effective Oil and Gas Industry Safety Management System (SMS).
OSHAcademy Course 900 Study Guide

Oil and Gas Safety Management

Copyright © 2020 Geigle Safety Group, Inc.

No portion of this text may be reprinted for other than personal use. Any commercial use of this document is strictly forbidden.

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 900.

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:

OSHAcademy

15220 NW Greenbrier Parkway, Suite 230
Beaverton, Oregon 97006
www.oshatrain.org
instructor@oshatrain.org
+1 (888) 668-9079

Disclaimer

This document does not constitute legal advice. Consult with your own company counsel for advice on compliance with all applicable state and federal regulations. Neither Geigle Safety Group, Inc., nor any of its employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. GEIGLE SAFETY GROUP, INC., DISCLAIMS ALL OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Taking actions suggested in this document does not guarantee that an employer, employee, operator or contractor will be in compliance with applicable regulations. Ultimately every company is responsible for determining the applicability of the information in this document to its own operations. Each employer’s safety management system will be different. Mapping safety and environmental management policies, procedures, or operations using this document does not guarantee compliance regulatory requirements.

Revised: July 22, 2020
## Contents

Course Introduction ........................................................................................................... 1

Module 1 – Safety Management System (SMS) Basics ......................................................... 2

  The Elements of a SMS .................................................................................................... 2

  Elements of a SMS .......................................................................................................... 2

Safety Culture ...................................................................................................................... 2

Real Safety Commitment .................................................................................................... 3

Effective Safety Leadership ................................................................................................. 4

Accountability for Safety .................................................................................................... 5

Developing Goals and Objectives ....................................................................................... 6

  Goals ............................................................................................................................... 6

  Objectives ....................................................................................................................... 7

Writing Safety Policies ....................................................................................................... 8

Writing Safety Programs .................................................................................................... 8

Responsibilities .................................................................................................................. 9

The Supervisor’s Safety Responsibilities ............................................................................. 11

  Related Employer Responsibilities ................................................................................. 11

Continuous Improvement ................................................................................................. 12

Module 2 – Working with Contractors .............................................................................. 14

Contractor Communications .............................................................................................. 14

The Pre-Bid Meeting ......................................................................................................... 15

The Pre-Mobilization Meeting ........................................................................................... 16

Contractor Selection Criteria ............................................................................................. 16

Experience Modification Rate (Mod Rate or EMR) ............................................................ 17
Total Case Incident Rate (TCIR) ................................................................. 18
Key Players ................................................................................................. 19
Project Designers .................................................................................... 20
Head Contractors ..................................................................................... 20
Subcontractors ......................................................................................... 22
Module 3- Involvement in Safety................................................................. 23
Management and Employees Must Be Involved ........................................ 23
Responding to Safety and Health Issues .................................................. 23
Employee Participation ............................................................................. 24
Preventing Ergonomic Injuries ................................................................. 24
Safety Inspections .................................................................................... 24
Safety Recognition Programs .................................................................... 25
The Oil and Gas Safety Committee ............................................................ 26
Suggestion Program ................................................................................. 27
Employee Right to Communicate ............................................................... 28
Module 4- SMS and Wellsite Analysis ....................................................... 29
Plan for Wellsite Analysis ....................................................................... 29
The Comprehensive Baseline Survey ......................................................... 29
Change Analysis ..................................................................................... 30
Job Hazard Analyses (JHA) ..................................................................... 32
Safety Inspections .................................................................................. 33
Module 5- Hazard Prevention and Control ............................................... 34
The Hierarchy of Controls ....................................................................... 34
Elimination .............................................................................................. 34
Substitution .................................................................................................................. 35
Engineering Controls .................................................................................................. 35
Warnings ...................................................................................................................... 36
Administrative Controls .............................................................................................. 36
Personal Protective Equipment ................................................................................... 37
Other Methods to Prevent and Control Hazards ......................................................... 38
Wellsite Inspections .................................................................................................... 38
Analyze Accident Investigations .................................................................................. 39
Control Hazardous Energy .......................................................................................... 39
Confined Space Entry .................................................................................................. 39
Analyze Fall Hazards ................................................................................................... 40
Analyze for Excavation Hazards .................................................................................. 41
Analyze for Hazardous Chemicals ............................................................................... 41
Analyze Electrical Hazards .......................................................................................... 42
Module 6- Total Safety Education and Training ............................................................. 44
The Importance of Total Safety Education and Training .............................................. 44
   Elements of Total Safety Education and Training .................................................. 44
Initial Training ............................................................................................................... 45
   Elements of Initial Orientation ............................................................................... 45
Ongoing Training .......................................................................................................... 46
Classroom and On-The-Job Training .......................................................................... 47
   Step #1 - Determine Training Needs ...................................................................... 47
   Step #2 - Identify Training Needs .......................................................................... 48
   Step #3 - Identify Learning Goals and Objectives ............................................... 49
Step #4 - Develop Learning Activities ................................................................. 50
Step #5 - Conduct the Training .............................................................................. 51
Step #6 - Evaluate the Program ............................................................................. 51
Step #7 - Program Improvement ............................................................................ 53
A Simple Seven Step On-The-Job Training (OJT) Process ................................... 54
Observations ........................................................................................................... 56
Module 7- Getting Started ..................................................................................... 57
Steps to Identify OSHA Requirements ................................................................... 57
  Step 1: OSHA Requirements Related to Leading Hazards at Oil and Gas Sites ...... 57
  Step 2: Other OSHA Requirements That May Apply to Your Jobsite .................. 61
  Step 3: Survey Your Workplace for Additional Hazards ...................................... 65
Recognized and Foreseeable Hazards ................................................................. 67
  “Recognized” Hazards ......................................................................................... 67
Step 4: Develop a Jobsite Safety and Health Program ............................................. 67
Step 5: Train Your Employees ............................................................................... 68
Step 6: Recordkeeping, Reporting and Posting ...................................................... 68
Step 7: Find Additional Compliance Assistance Information .................................. 69
Endnotes .................................................................................................................. 71
Course Introduction

The public’s and government’s perception of the nature of the oil and gas industry has experienced a large shift since the 2010 blowout of the BP offshore well in the Gulf of Mexico. Other incidents of ruptured pipelines, spills, and explosions throughout the United States have also changed the perception.

According to the Bureau of Labor Statistics, the oil and gas extraction industry has an annual occupational fatality rate of 27.5 per 100,000 workers (2003-2009) - more than seven times higher than the rate for all U.S. workers.

Oil and gas industry workers engage in many activities that may expose them to serious hazards, such as falling from towers, unguarded machinery, being struck by heavy equipment, electrocutions, and silica dust.

This course is an introduction to the basic elements of an effective Oil and Gas Industry Safety Management System (SMS).

The information, tools, and resources provided in course are designed to help you, whether you are an employer or employee, to identify, reduce, and eliminate oil and gas-related hazards.

Like all companies in the oil and gas industry, you need to tailor your Safety Management System (SMS) to your own specific work operations and work environments.

An effective SMS has five primary elements:

1. safety culture
2. involvement
3. wellsite analysis
4. hazard prevention and control
5. education and training
Module 1 – Safety Management System (SMS) Basics

The Elements of a SMS

Whether we realize it or not, every company has a SMS. The question is, what does it look like? In some companies, the SMS is nothing more than a loose collection of ill-thought-out programs and activities. Other companies, that understand the benefits, will develop an effective integrated SMS that include important elements and activities.

Elements of a SMS

- **Vision statement**: Tells the world what the company would like to have accomplished in the future.
- **Mission statement**: Tells the world why the company exists. It's purpose. What it does.
- **Goals and Objectives**: Intended outcomes that support the mission and vision.
- **Policies**: General guidance formulated and implemented by managers at all levels.
- **Programs**: Describe coordinated strategies that support policy.
- **Plans**: Give clear written (formal) guidelines on how to implement programs and policies. Includes long-term strategies and short-term tactics.
- **Processes**: Make sure safety is integrated into operational processes.
- **Procedures**: Ensure concise formal/informal step-by-step instructions.
- **Practices**: Employee methods and techniques that help to protect employees from injury or illness.
- **Budgets**: Funding that supports investment in all of the above.
- **Rules**: Clearly stated specifications and performance standards.
- **Reports**: Reflect process and measures results. Evaluates effectiveness of all the above.

Safety Culture

The most successful Safety Management System (SMS) includes an underlying safety culture that reflects long-term commitment to safety and tough-caring leadership.
Believe it or not, OSHA has a pretty good definition for a safety culture. OSHA defines a safety culture as a combination of an organization's collective safety attitudes, behaviors, beliefs, values, ways of doing things, and other shared characteristics.

Employers and employees see culture from different perspectives. From the employer's point of view, the company's safety culture is something to be managed, but if you ask employees to define the company's culture, they will likely tell you it's "just the way things are around here."

This first module will briefly explore commitment, leadership, and responsibilities, and take a look at some of the other important components that are necessary in an effective SMS and culture.

1. The most successful Safety Management System (SMS) includes a safety culture that _____.
   a. makes a long-term serious commitment to safety
   b. includes a vigorous statement of belief
   c. encourages everyone to work safe
   d. tells everyone management supports safety

**Real Safety Commitment**

The success of your company's SMS depends on the willingness of top management to demonstrate a long term serious commitment to protect every employee from injury and illness on the job.

But how do you get it top management commitment if you don't already have it? Real commitment doesn't just appear out of thin air. Real commitment values safety.

Management commitment to safety will occur to the extent each manager clearly understands the positive benefits derived from their effort. Understanding the benefits will create a strong desire to do what it takes to improve the company's safety culture.

Managers who understand the positive benefits will more likely invest serious time and money into effective safety management by developing safety policies, programs, plans and procedures. They will also display leadership through effective accountability and recognition of behaviors and results.
Management involvement and commitment can be shown by:

- Allocating dedicated health and safety resources
- Setting clear expectations for health and safety performance
- Assigning and monitoring health and safety responsibilities
- Demonstrating active leadership

**Bottom line:** Serious commitment requires serious time and money.

2. **When is it more likely that management will make a serious commitment to safety?**

   a. When they can control behaviors
   b. When they understand the benefits
   c. When they understand the costs
   d. When they communicate regularly with OSHA

**Effective Safety Leadership**

Every day, oil and gas workers, supervisors and managers have many opportunities to communicate and act in ways that demonstrate safety leadership. Unfortunately, these opportunities go unanswered because they are just not seen as real leadership opportunities.

We believe that a company’s leadership is the most important asset it possesses. It’s important that employers and managers understand that the simple expression of tough-caring safety leadership – having high safety standards because you care about the employee - can result in enormous benefits. The ability to perceive leadership opportunities improves the company's potential to succeed.

Tough-caring leaders also assume their workers, at all levels of the organization are good people trying to do the best they can with the skills they have.

Employees, on the other hand, do not always have the physical resources and psychosocial support needed to achieve the kind of results expected of them. Why is that? It is because they are not being provided with adequate physical resources (tools, equipment, machinery, materials, etc.) or the education, training, time, and consequences.

Effective leadership can overcome these challenges by providing the resources and training needed for their workers to excel.
3. Why do managers display tough-caring safety leadership?

a. They want to be seen as a tough manager
b. They have a zero-tolerance for safety
c. They feel a need to control situations
d. They care about their employees

**Accountability for Safety**

Accountability ranks right at the top with management commitment as a critical ingredient in a company’s safety and health management system. Why do we behave the way we do in the workplace? Consequences. Why do we take the unsafe shortcut? Again, consequences play a factor.

Accountability may be thought of as establishing the "obligation to fulfill a task to standard or else." When you are held accountable, your performance is measured against specific criteria and consequences are applied appropriate to the level or quality of performance.

*Example: If a builder has built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be slain. (King Hammurabi of Babylon, 18th Century B.C.)*

*Example: “The ancient Romans had a tradition: whenever one of their engineers constructed an arch, as the capstone was hoisted into place, the engineer assumed accountability for his work in the most profound way possible: he stood under the arch.” (Michael Armstrong- Former CEO of AT&T, Hughes Electronics, and Comcast)*

Management may impose all kinds of safety policies, programs, written plans, directives, rules, training, etc., yet if appropriate application of effective consequences within a culture of accountability does not exist, desired behaviors will not be sustained. If employees do not believe they are going to be held accountable for the decisions they make and the actions they take, you can be sure that any safety effort is ultimately doomed to fail.

Six important elements should be present in an employer safety accountability system:

1. formal standards of performance
2. adequate resources and psychosocial support
3. a system of performance measurement
4. application of effective consequences

5. appropriate application of consequences

6. continuous evaluation of the accountability system

If you believe there are weaknesses in your employer's accountability system, make sure to document the behaviors and conditions you see in the workplace that may be pointing to accountability system policies, plans, processes, procedures and practices that are inadequate or missing. You can learn more about accountability systems in OSHAcademy courses 116 and 712.

4. What ensures an employer's safety management system will ultimately fail?

   a. When management does not consult with OSHA
   b. Accidents always result in reprimand
   c. A lack of consequences
   d. Zero tolerance for unsafe acts

Developing Goals and Objectives

To make sure the safety management system is successfully designed, developed and deployed, it's important to write effective goals and objectives. Many companies treat goals and objectives as though they are the same, but they're not. Let's look at the differences and see some examples.

Goals

Goals short unstructured statements and are easy to write. They're nothing more than wishes. For instance, a goal might be to:

- Designate a qualified safety person to coordinate the program.
- Plan for safety using a written Job Safety Analysis.
- Make regular wellsite safety inspections and conduct health monitoring.
- Follow safety procedures and rules.
- Provide on-going safety training.
- Enforce safety rules and use appropriate discipline.
Objectives

Objectives are much more than mere wishes. They are structured, action-oriented statements that describe a specific outcome. Objectives should be relevant, agreed-upon, important, and realistic. They should be written using clearly stated, measurable, observable, and time-sensitive terms that describe how to accomplish a specific outcome.

A well-written objective should include the following components:

- **It starts with an action verb.** (i.e., decrease, increase, or improve)
- **It describes observable results.** (i.e, performance, behaviors, quantity, or quality)
- ** Specifies a single key result.** (i.e., The percentage of employees trained in PPE)
- **Results are quantifiable.** Uses numbers to measure a desired change. (i.e., numerical, percentage)
- ** Specifies a target date** for accomplishment. (i.e., by end of the third quarter)

Examples of safety objectives include:

- Increase the number of safety suggestions to 25 a month by July 31st.
- Reduce the number of back injuries in the warehouse by 70% by the end of 2020.
- Conduct safety training on lockout/tagout to all maintenance employees within three months.
- Lower the number of injury accidents by 90% by the end of the fiscal year.

5. What ensures an employer's safety management system will ultimately fail?

   a. Conduct regular safety inspections on the wellsite
   b. Follow all safety rules and guidelines
   c. Reduce back injuries on the wellsite by 70% by the end of June
   d. Conduct accident investigations after injury incidents
Writing Safety Policies

Safety policies help to set standards and guidelines for decision-making. They let managers, supervisors and employees make safety decisions with some degree of confidence without having to constantly check with “the boss”. Managers, supervisors and workers know they are making decisions that conform to corporate safety policies.

Below are a number of points that would be good to adopt in your companies’ safety and health policy.

- No job or no task is more important than worker health and safety.
- A wellsite Job Hazard Analysis (JHA) will be conducted on all tasks with a potential safety or health threat.
- Every procedure must be a safe procedure. Shortcuts in safe procedures by either foremen or workers must not be tolerated.
- If workers observe any wellsite unsafe condition, which may pose a potential threat to their health or safety, they will immediately correct the situation when feasible or inform management.
- Management has the responsibility to take adequate proactive precautions, comply with OSHA standards, and assure the safety and health of employees.
- If a job cannot be done safely it will not be done.
- Leadership within a company will acknowledge the importance of creating a positive safety culture through employee involvement and effective policies and procedures.

Writing Safety Programs

A safety “program” may be thought of as a plan of action to accomplish a safety objective. An effective safety program is designed around the processes, procedures, and practices normally assigned to employees and integrate safety-related decisions and precautions into them. Oil and gas contractors must initiate and maintain such programs as may be necessary to comply with CFR 1926.20. Ref: 1926.20(b) See Module 7 for more information on Programs.
6. What is the primary purpose of writing a safety policy?

   a. To give supervisors better control employee behaviors
   b. To let supervisors make decisions without checking with the boss
   c. To give everyone some idea about safety
   d. To prevent unsafe decisions from being made

Responsibilities

It’s important to understand who is responsible for safety on the oil and gas wellsite construction. According to OSHA, there are four employer roles or categories on a multi-employer wellsite:

1. **Creating employer**: The employer that caused a hazardous condition that violates an OSHA standard.

2. **Exposing employer**: This is an employer whose own employees are exposed to the hazard.

3. **Correcting employer**: This is an employer who is engaged in a common undertaking, on the same wellsite construction as the exposing employer, and is responsible for correcting a hazard. This usually occurs where an employer is given the responsibility of installing and/or maintaining particular safety/health equipment or devices.

4. **Controlling employer**: This is an employer who has general supervisory authority over the wellsite construction, including the power to correct safety and health violations itself or require others to correct them. Control can be established by contract or, in the absence of explicit contractual provisions, by the exercise of control in practice.

The controlling contractor assumes all obligations under the standards, whether or not he subcontracts any of the work [29 CFR 1926.16(b)].

To the extent that a subcontractor agrees to perform any part of the contract, he assumes responsibility for complying with the standards with respect to that part [29 CFR 1926.16(c)].

With respect to subcontracted work, the controlling contractor and any subcontractors are deemed to have joint responsibility [29 CFR 1926.16(d)].
7. Who assumes all obligations for safety on the wellsite whether or not he subcontracts any of the work?

   a. The correcting contractor
   b. The controlling contractor
   c. The exposing contractor
   d. The creating contractor

Oil and gas companies should designate a competent and qualified safety representative to coordinate, implement, and administer the Safety Management System (SMS). The safety representative should be thought of as an internal safety consultant and should not be responsible for enforcing safety rules. Enforcement of safety rules is the job of line managers, not staff personnel. Responsibilities of the safety representative include:

1. Understand potential job hazards and how to eliminate them.

2. Conduct or assist with Job Hazard Analysis.

3. Assure compliance with OSHA oil and gas safety and health standard requirements.

4. Conduct regular job site safety and health inspections.

5. Establish safety and health procedures.

6. Coordinate regular safety and health training.

7. Conduct or assist with Tailgate or Tool Box Talks.

8. Maintain documentation of training, inspections, injuries and illnesses, and other safety records.

9. Participate in accident investigations and implementation of corrective actions.

10. Involve employees in the implementation of the SHMS.

11. Create statistical reports that compare severity and frequency rates against prior records.
8. The oil and gas company should designate a competent and qualified safety representative to perform each of the following responsibilities EXCEPT_____.

   a. conducting safety inspections
   b. establishing safety and health procedures
   c. enforcing safety rules
   d. coordinating safety training

The Supervisor’s Safety Responsibilities

The supervisor’s attitude plays an important part in obtaining or preventing the acceptance of safe and healthful work practices, policies, and procedures. It is the supervisor’s responsibility to identify potential hazards, identify methods to control or eliminate wellsite hazards, ensure workers use safe and healthful work practices, and make sure everyone receives safety and health training to do their work.

Immediate supervisors should review, investigate, and take any necessary and appropriate action on all employee reports of hazards or potential hazards.

Related Employer Responsibilities

According to OSHA, employers also have these general safety responsibilities:

1. Provide employees with sanitary and safe working conditions [29 CFR 1926.20(a)].
   Assign safety and health responsibilities [29 CFR 1926.20(b)].

2. Give safety and health designees authority to correct hazards [29 CFR 1926.32(f)].

3. Assure employees that they may voice safety and health concerns without fear of reprisal [29 CFR 1903.11(d)].


6. Post the OSHA State or Federal Poster [29 CFR 1903.2(a)].
9. Who should review, investigate, and take any necessary and appropriate action on all employee reports of hazards or potential hazards?

   a. Immediate supervisors
   b. Exposing employer
   c. Safety staff
   d. Safety officers

**Continuous Improvement**

It’s important to the overall success of the safety management system that the company makes a commitment to continuous improvement of all aspects of safety and health.

One successful change management technique is to use the Plan-Do-Study-Act (PDSA) Cycle. It was first developed by Dr. Walter Shewhart, and later applied by W. Edwards Deming, the father of total quality management, to transform the industry of Japan after World War II. He promoted the PDSA Cycle that was partly responsible for Japan's meteoric rise in manufacturing. He believed that statistics hold the key to improving processes, and that management must take responsibility for quality in the workplace because management controls the processes.

The PDSA Cycle contains four important steps:

1. Plan - plan what you're going to do
2. Do - test the plan small scale
3. Check - analyze the results
4. Act - improve the plan and fully implement

You can learn more about this important topic in OSHAcademy Course 700, Safety and Health Management, Module 8.
10. Why did Deming believe that management must take responsibility for quality in the workplace?

a. Management controls the processes
b. Management is required by OSHA to do so
c. Management writes the rules
d. Management administers consequences
Module 2- Working with Contractors

Oil and gas contractors are responsible for ensuring that all work under contract meets or exceeds the OSHA standards in addition to complying with the company’s safety and health standards. The contractor is responsible for ensuring safe work performance of employees and subcontractors.

Oil and gas contractors provide a variety of oil and gas services, including:

- wells construction and maintenance activities
- utilities and infrastructure construction
- property maintenance
- training and consultation
- installation, testing, calibration, repair, and maintenance of equipment and instruments

All of these work activities must be performed safely and in accordance with the applicable safety codes, standards and regulations.

1. Which of the following safety standards must oil and gas contractors ensure compliance with under the contract?
   
   a. DHS and OSHA standards  
   b. BSEE and OSHA standards  
   c. OSHA and company standards  
   d. Company and NIOSH standards

Contractor Communications

It’s important that the employer involve communications about safety in all phases of the oil and gas project. From the time the project is conceived until it is finished, safety must be a part of the process.

During the Pre-Award phase, requirements are developed, solicitations are sought, contractors are selected, and contracts are awarded. The employer should engage in all of the following key safety-related efforts during this phase:

- consider the contractor's past performance during the contractor selection process.
• establish appropriate safety and health requirements in contract specifications.

• ensure the inclusion of applicable safety and health clauses in contracts.

2. Which of the following is NOT part of the Pre-Award phase of the oil and gas project?
   a. Identify potential hazards during the project
   b. Consider the contractor's past performance
   c. Establish appropriate safety and health requirements
   d. Include safety and health clauses in contracts

The Pre-Bid Meeting

In the Pre-Bid meeting, contract safety requirements should be discussed, including:

• site specific safety plan

• designated safety representative identification and requirements

• daily pre-work coordination meetings

• safety enforcement policies and procedures

• drug screening

• identification of potential hazards

• defining hazard control responsibilities

3. During the Pre-Bid meeting, which of the following contractor safety requirements is discussed?
   a. Employee recognition benefits and incentives
   b. Safety enforcement policies and procedures
   c. Human resource recordkeeping guidelines
   d. Safety and health management concepts
The Pre-Mobilization Meeting

During the pre-mobilization meeting, the following should be discussed:

- Contractual safety requirements
- Site-specific safety plan
- Pre-Phase work plan discussion
- Requirement for daily pre-task meetings
- Requirements for safety talks, worker and supervisor training
- Confirm assignment of safety responsibilities

The roles, responsibilities, accountability and authority of the owner, general contractor and all contractor personnel should be discussed.

4. During the pre-mobilization meeting, which of the following should be discussed?
   a. Total case incident rates (TCIRs)
   b. Employer past citations and safety performance
   c. Requirements for safety talks, worker and supervisor training
   d. Experience modification rates (MODs)

Contractor Selection Criteria

It’s traditional to select oil and gas contractors based on three criteria:

- low bidder
- lower bidder
- lowest bidder who can start now

However, in a world-class oil and gas company that understands the importance of safety, they will not make a decision based solely on cost.
Those companies will use the following criteria:

- Total Case Incidence Rate (TCIR)
- Experience Modification Rate (EMR) of less than 1.0
- past safety performance
- site-specific safety plan development
- key management and worker experience

5. A world-class oil and gas company that understands the importance of safety-related will NOT make a safety decision based _____.
   
   a. low bid  
   b. solely on cost  
   c. total case incident rate  
   d. environmental hazards

**Experience Modification Rate (Mod Rate or EMR)**

Experience Modification Rate (EMR) has strong impact upon a business. It is a number used by insurance companies to gauge both past cost of injuries and future chances of risk. The lower the EMR of your business, the lower your worker compensation insurance premiums will be. An EMR of 1.0 is considered the industry average. (Source: Safety Management Group).

According to the Michigan Oil and Gas Users Council (MCUC), the following EMR chart indicates the relative effectiveness of a contractor’s SMS.

- 0.30 - 0.71 = Superior – Distinguished results
- 0.72 - 0.81 = Effective – Impressive results – Obvious commitment
- 0.82 – 1.04 = Average – Within industry norm
- 1.05 – 1.29 = Inadequate – Conspicuous past problems
- 1.30 – 2.05 = Poor – Lack of safety involvement

As you can see, safety is a serious consideration when choosing contractors to work on the oil and gas project. Using these criteria will not only result in selecting a higher level of contractor
safety, it will also result in selecting a contractor that will be more professional in all aspects of the contracted work that will be performed.

6. Which of the following Experience Modification Rate (EMR) ranges indicates that the contractor has the most effective SMS?

   a. 0.30 - 0.71  
   b. 0.72 - 0.81  
   c. 0.82 - 1.04  
   d. 1.05 - 1.29

**Total Case Incident Rate (TCIR)**

The Total Case Incident Rate, or “TCIR” is a common method used to report workplace injuries. It is defined as the average number of work-related injuries incurred by 100 workers during a one-year period. Use of the TCIR to report workplace injuries allow comparison of accident and injury statistics across industries, among industry segments, and from one year to the next.

The TCIR is typically calculated as follows:

\[
\text{TCIR} = \frac{200,000 \times \text{annual # of injuries/illnesses}}{\text{annual total # of hours worked}}
\]
For example, if an employer with 500 workers reported 10 injuries in 2013, and workers in that industry worked 1,000,000 hours that year, then the 2013 TCIR for that employer would be:

\[
\text{TCIR} = \frac{200,000 \times 10}{1,000,000} = \frac{2,000,000}{1,000,000} = 2.0 \text{ injuries per 100 workers}
\]

7. The 200,000 value in the TCIR equation is defined as the average number of work-related injuries incurred by _____.
   a. all FTE workers during a one-year period
   b. 100 FTE workers during a one-year period
   c. all FTE workers during a 3-year period
   d. 100 FTE workers during a 3-year period

**Key Players**

The contractor, the owner, general contractor, project manager, site superintendent, and safety manager, should all have:

- previous experience on similar type oil and gas projects
- previous experience on projects of similar size
- a history of success on previous projects

All managers on the oil and gas site should be competent in safety management. Workers should be competent in the work they are performing. Heavy equipment operators should all be able to show written documentation providing proof of competency. Also, a trained on-site healthcare provider or nurse should be present on large projects (more than $75 million).
8. Which of the following is an important qualification that helps to ensure all contract managers are competent?

   a. Accreditation by a recognized construction board
   b. Experience in management in general industry manufacturing
   c. At least 3-years experience on construction projects
   d. A history of success on previous projects

Project Designers

Project designers that are involved in the oil and gas phase should do the following:

- Identify the impact of changes in your design on the health and safety of those involved in the project.
- Provide sufficient information on health and safety associated with your design and planning to those who need it, so they can conduct the necessary training if needed.
- Cooperate and coordinate with the contracted parties, and, where appropriate, other designers/advisers involved in the project.
- Provide ongoing advice and information, if requested, regarding the head contractor’s health and safety plan (such as by advising of any changes to planned activities).
- Make sure other designers/advisers and contractors continue to carry out their duties and coordinate with others on the project (such as by asking for regular written activity reports or holding site meetings).

9. Who should provide sufficient information on health and safety design and planning to those who need it so they can conduct required training?

   a. The designated government official
   b. The employer
   c. The Site Safety and Health Officer
   d. The project designer

Head Contractors

The general or head contractor on site should do the following:
10. Which of the following should be a responsibility of the head or general contractor?

   a. Communicate recordkeeping statistics to the department of labor
   b. Arrange toolbox/tailgate meeting times to discuss safety
   c. Coordinate with OSHA to conduct inspections
   d. Ensure discipline whenever accidents occur
Subcontractors

Each subcontractor on site should do the following:

- Develop a site-specific safety plan for your work activity.
- Identify the hazards of your work, assess the risks arising from them, and tell the head contractor and client about how these risks will be controlled.
- Obtain evidence of the training and competence of your subcontractors and employees.
- Keep the head contractor informed of any dangerous incident or accident.
- Provide the head contractor with the information needed for health and safety management.
- Cooperate with the head contractor and other contractors on health and safety matters.
- Follow any directions of the client or head contractor so that they can meet their obligations.
- Provide information and training to your employees on site.

11. Which of the following should be a responsibility of the head or general contractor?
   a. Communicate recordkeeping statistics to the department of labor
   b. Arrange toolbox/tailgate meeting times to discuss safety
   c. Coordinate with OSHA to conduct inspections
   d. Ensure discipline whenever accidents occur
Module 3- Involvement in Safety

Management and Employees Must Be Involved

Employee involvement provides the means through which workers develop and express their own commitment to safety and health.

The best safety and health management systems involve employees at every level of the organization. Employees are often those closest to the hazard and have the most first-hand knowledge of workplace hazards. Clearly, the employer has ultimate responsibility for its workers; however, using employees’ knowledge and experience to help identify and resolve problems can make the system more effective.

It's difficult to have an effective safety and health program without developing a corporate safety culture that encourages genuine employee involvement. When you mention involvement in safety, most people think only about “employee” involvement, but to do it right, management should be out front and involved.

Management needs to lead by example and that means communicating and following through with action. This module will discuss some of the components of employer and employee involvement in safety.

1. How do the best safety and health management systems involve employees?
   a. They are involved if in the best interest of the company
   b. They are involved as required by OSHA
   c. They are involved at every level
   d. They are involved as necessary

Responding to Safety and Health Issues

Management in your company should take prompt consistent action when responding to safety and health issues. Doing so will demonstrate their commitment to addressing safety and health concerns and encourage employee participation.

- Management should respond to employees' reports of actual or potential hazards and any other safety concerns employees might have.

- There should be an effective process for employees to report such hazards.
• Management should notify the employee reporting a real or potential hazard of the outcome promptly in a timely manner.

• Management should respond to employee suggestions promptly as soon as possible. They should not be slow to respond.

• Reporting hazards should be made without fear of reprimand or any safety reporting process is doomed to failure.

Employee Participation

The employees in your company should be given an opportunity to provide input regarding recommendations on safety and health products, procedures, and training as it pertains to daily work operations. For example, employees could be given some responsibility to test out products or conduct research to substantiate recommendations. Employee input is effectively provided through the suggestion system, the reporting of hazards, or through actions the safety and health committee initiate. Employees can also participate in a variety of ways such as; a trainer, inspector, or problem solver.

2. When should management respond to employee hazard reports and suggestions?

   a. Promptly
   b. As time allows
   c. Within two weeks after the report or suggestion
   d. Only after a solution has been obtained

Preventing Ergonomic Injuries

More than a third of all accepted disabling claims are sprains/strains and other musculoskeletal disorders. Although oil and gas work will always include lifting, carrying, and pulling (among others), many contractors have made great strides in preventing these types of injuries through pre-task planning, employee involvement in exercise programs, medical management, and training their crews to recognize risk factors and best practices.

Safety Inspections

One of the best ways employees can participate in the company's safety program is to help conduct safety inspections. This gives employees a greater sense of ownership in safety and it can be a real educational experience too!
Depending on the hazardous nature of the oil and gas on the wellsite, weekly or daily inspections may be needed to effectively identify hazards and unsafe actions.

3. What is one of the best ways employees can participate in the company’s safety program?

   a. Fix rather than report hazards
   b. See something, say something
   c. Report safety hazards to OSHA
   d. Help conduct safety inspections

Safety Recognition Programs

It's important to understand that designing, developing and deploying safety "programs" is basically a management function requiring effective organizational skill. Many companies develop and implement formal safety recognition programs because that is what they've been told works best and that is what everyone else does.

There are many different types of safety recognition program strategies used and promoted these days. Of course, some are more effective than others, but there is certainly no one-fits-all program. To be successful, the recognition program should fit the unique culture of the organization.

4. To be successful, the recognition program should _____.

   a. recognize only the best or top performer
   b. emphasize cost savings
   c. fit the unique culture of the organization
   d. be standardized within the industry

For instance, you can't have a highly successful safety recognition program in an oppressively authoritarian corporate culture displaying tough-coercive leadership due to the lack of positive relationships between managers and employees.

A recognition program, within a controlling (typical) safety culture will usually think a “managed” program is necessary to be successful. The “suggestion box” is likely to be used to maintain anonymity which is symptom that a lack of trust exists: It just won't work.

On the other hand, a world-class safety culture may not have the need to develop a managed safety recognition program with formal procedures: why?
Because managers will likely perceive the process of recognition as their opportunity to demonstrate leadership through recognition so that ultimately, positive working relationships are established or reinforced. You can learn more about leadership styles and recognition systems in OSHAcademy course 700.

5. Which type of safety culture is most likely to use suggestion boxes as part of a planned or managed approach to safety recognition?

   a. A coercive safety culture
   b. A controlling safety culture
   c. A laissez-faire safety culture
   d. A tough-caring safety culture

The Oil and Gas Safety Committee

The purpose of a safety and health committee is to give employees the ability to participate in the implementation of the safety and health system that exists within your company.

The main incentive for developing a safety committee is to encourage and heighten employee involvement in the company safety program. Employee input is a critical part of a successful safety program. A safety committee is one way to obtain that input. The level of involvement by employees and degree of management commitment will determine if a safety committee is successful.

Safety committees have many benefits; identify safety and health concerns that workers/management consider most critical, help find creative solutions, show a good faith effort toward health and safety regulations, boost coworker loyalty, morale and enthusiasm by getting involved in an issue that’s important to everyone, and if new safety rules are needed, a safety committee can help make sure employees accept and follow them.

6. Which of the following are factors that determine the success of the safety committee?

   a. OSHA regulatory requirements
   b. Participation, time, and money
   c. High level of accountability
   d. Pizza and time off work
The safety committee in your company should be comprised of management and employee representatives. The committee should meet at least weekly due to the hazardous nature of work on a project. 

The committee should:

- Have defined goals and objectives.
- Address safety and health issues.
- Record and post minutes of the meetings.
- Involve employees in problem solving.
- Document action taken and post on the bulletin boards for all employees to read and-or comment.
- Have a formal agenda.

7. What are the two factors that usually determine how often safety committees should meet?
   
   e. Severity of the hazard and frequency of change
   f. OSHA rules and company safety policy
   g. Probability of injury and SSHA requirements
   h. Nature of the work and company rules

Suggestion Program

The employees in your company should be encouraged to make safety and health suggestions to help improve a process, prevent an accident, or to make any improvement in the safety and health system.

The suggestion system should be implemented by a designated person, usually the safety director, who will be responsible for determining priority and the proper means of implementation. It’s important to remember that in effective safety cultures, it’s not necessary to have a policy that anonymity will be assured because a high level of trust exists between managers and employees.
Safety suggestions should be shared with the Safety and Health Committee for input. Suggestion forms may be placed in suggestion boxes or given directly to a designated person such as the immediate supervisor or safety committee chairperson.

8. **In a truly effective safety culture, why is it unnecessary to have a written policy that promises safety suggestions will remain anonymous?**

   a. A high level of trust exists
   b. An established tradition controls behaviors
   c. The safety manager responds to all suggestions
   d. Safety suggestions are not considered important

### Employee Right to Communicate

OSHA requires employer to make sure employees are able to voice safety and health concerns without fear of reprisal. Think about it: would a perception of reprisal for voicing a safety concern benefit the company? No way!

More specifically, according to OSHA, no employer can discharge or in any manner discriminate against any employee because the employee has:

1. filed any complaint or instituted or caused to be instituted any proceeding under or related to the OSH Act,
2. testified or is about to testify in any such proceeding, or
3. has exercised any right afforded by the OSH Act on behalf of himself or others.

Prior to or during an OSHA inspection of a workplace, any employee or representative (usually a union person) may notify an OSHA Compliance Safety and Health Officer, in writing, of any violation of the Act which they have reason to believe exists in such workplace.

9. **Which action is protected by OSHA regulations from discharge or in any manner of discrimination?**

   a. Testimony given in a OSHA proceeding
   b. Refusal to do a job felt to be unnecessary
   c. Use of legal drugs without prior approval
   d. Reporting errors in production
Module 4 - SMS and Wellsite Analysis

Plan for Wellsite Analysis

When planning for an oil and gas wellsite analysis, be sure to include the following four processes:

- comprehensive baseline survey
- change analysis
- job hazard analyses (JHA)
- periodic and daily safety inspections

The Comprehensive Baseline Survey

A comprehensive baseline survey and analysis is a first attempt at understanding:

- the potential hazards that may exist at a new wellsite, or
- the hazards that currently exist at a working wellsite.

It establishes initial levels of exposure (baselines) for comparison to future levels uncovered in follow-up surveys and analyses, so that changes can be recognized. Basically, the baseline survey tells the employer what the starting point is.

A comprehensive baseline survey should include a review of previous accidents, injuries, and illnesses; complaints; previous studies; etc. Comprehensive surveys should be performed depending on the business size and nature of the hazards at least every three years by private consultants, insurance company, and/or state-funded programs.

1. Which process is the first attempt at understanding potential and actual wellsite hazards?
   
   a. Behavior based analysis
   b. Daily safety meetings
   c. Comprehensive baseline survey
   d. Periodic safety stand-downs
The baseline survey should include a review of the following:

1. copies of written inspections and surveys by: fire department and in-house as required by safety and health standards (e.g., overhead crane inspections, powered industrial truck daily inspection, etc.)

2. employee report of hazards or potential hazards

3. accident and incident investigations with corrective actions and follow-up

4. injury and illness trend analysis

5. personal protective equipment (PPE) assessment

6. ergonomic analysis

7. specific identification of confined spaces

8. identification of energy sources for specific machines

As part of the wellsite analysis process, the employer/general contractor should also require subcontractors to perform a baseline analysis as necessary in accordance with OSHA and company requirements. The subcontractors should share pertinent information with the general contractor, and/or other subcontractors.

2. What should subcontractors do with their baseline survey analysis?

   a. Share it with other contractors
   b. Forward results to OSHA within 30 days
   c. File the survey with other documents
   d. Keep the results of the survey confidential

Change Analysis

As you know, change is continuous on an oil and gas wellsite. Change analysis is simply the analysis of the management of change, conducted by competent persons, to make sure that change on the wellsite does not introduce new hazards or unsafe procedures in the work environment.
A designated person should analyze how changes on the wellsite can affect equipment, processes, and materials for hazards and potential hazards. Findings should be documented, and plans developed to minimize or design out the new hazards.

Changes in the following general categories need to be reviewed:

- wellsight layout
- materials
- process technology
- equipment

All areas on the worksite should be analyzed to more specifically analyze how changes to the wellsight layout, materials, processes and equipment, affect the work being conducted. Click on the button to see specific areas that should be analyzed.

Analyze each of the following areas as part of the baseline survey:

- site entrance and traffic routes/surfaces
- covered walkways
- protection from falling objects
- danger areas
- storage and personnel areas
- hazardous materials/dangerous goods
- barriers and fences
- loading and unloading areas
- bays and ramps
- working, slopes for excavators, dump trucks etc.
- safety signage
• protection of pedestrians
• site security
• housekeeping and cleanliness

3. What is the purpose of conducting change analysis?
   a. Assure equipment and processes are not changed
   b. Ensure change is controlled in a cost-effective manner
   c. Ensure compliance with OSHA oil and gas regulations
   d. Make sure change does not introduce new hazards

Job Hazard Analyses (JHA)

A Job Hazard Analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship among the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.

A JHA should be conducted for all hazardous jobs/procedures to determine potential hazards and identify methods to reduce exposure to those hazards at oil and gas wellsites. Here are the steps in a basic JHA:

1. List the steps in the job or procedure.
2. Describe the safety and health hazards in each step.
3. Develop preventive measures.
4. Write a safe job procedure.

You can learn more about conducting a JHA in OHAcademy course 706.
4. Which of the following is the first step in the JHA process?

a. Describe the safety and health hazards in each step  
b. Write a safe job procedure  
c. List the steps in the job or procedure  
d. Develop preventive measures

Safety Inspections

Employees play a key role in identifying, controlling, and reporting hazards that may occur or already exist in your workplace. Safety inspection reports of potential hazards can be an effective tool to trigger a closer look at a piece of equipment, operation, or how work is being performed. Reports of potential hazards can also provide suggestions to eliminate a hazard.

The frequency of a walk-around safety inspection depends on the nature of the work and workplace. Worksites that experience more change and a higher risk for serious injury or illness require more frequent inspections. For wellsites, daily inspections are a must because of the rapidly changing nature of the site and its hazards.

At small fixed worksites, the entire site should be inspected at one time. And even for the smallest worksite, inspections should be done at least quarterly. If the small worksite uses hazardous materials or involves hazardous procedures or conditions that change frequently, inspections should be done more often.

Sound Safety Inspection Policy: All employees should inspect their area of responsibility at the beginning and end of each shift and bridge the inspections with continual observation. If a hazardous condition is observed, eliminate it if you safely can, or report it immediately.

5. What factors determine the frequency of a walk-around inspection?

a. OSHA inspection requirements  
b. Degree of change and risk at the worksite  
c. Company best work practices  
d. Number of employees at the worksite
Module 5- Hazard Prevention and Control

The Hierarchy of Controls

Controlling exposures to wellsite hazards is the fundamental method of protecting workers on an oil and gas site. Controlling hazards and exposures is the fundamental method of protecting workers. ANSI/ASSP Z10-2012, Occupational Health and Safety Management Systems, encourages employers to use the following hierarchy of hazard controls:

1. Elimination
2. Substitution
3. Engineering controls
4. Warnings
5. Administrative controls
6. Personal protective equipment

The idea behind this hierarchy is that the control methods at the top of the list are potentially more effective and protective than those at the bottom. Following the hierarchy normally leads to the implementation of inherently safer systems. The risk of illness or injury should be substantially reduced. Let’s take a closer look at each of the control measures.

1. Which of the following hierarchy of control methods is considered most effective and protective?
   a. Engineering controls
   b. Administrative controls
   c. Elimination
   d. Personal Protective Equipment

Elimination

The best control measure to control a hazard is to eliminate it. If you don’t have the hazard, you won’t get injured. While elimination is the most effective at reducing hazards, it also tend to be the most difficult to implement in an existing process.
If the oil and gas project is still at the design or development stage, elimination and substitution of hazards may be inexpensive and simple to implement. For an existing process, major changes in equipment and procedures may be required to eliminate or substitute for a hazard.

**Substitution**

The next best control measure is to substitute something else in its place that would be non-hazardous or less hazardous to workers. For example, a non-toxic (or less toxic) chemical could be substituted for a hazardous one.

### 2. When is it less expensive and more feasible to eliminate hazardous conditions at the wellsite?

- a. Prior to well completion
- b. During the site preparation phase
- c. During the design or development phase
- d. Once drilling has commenced

**Engineering Controls**

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The initial cost of engineering controls can be higher than the cost of administrative controls or personal protective equipment, but over the longer term, operating costs are frequently lower, and in some instances, can provide cost savings in other areas of the process. Engineering controls should be designed to make it difficult for employees to defeat the controls.

Engineering controls include methods such as:

- using noise dampening technology to reduce noise levels;
- enclosing a chemical process in a Plexiglas "glove box";
- using mechanical lifting devices; or
- using local exhaust ventilation that captures and carries away the contaminants.
3. Which of the following is TRUE concerning the use of engineering controls?

   e. Initial costs to implement engineering controls is usually quite low
   f. Over the long term, the cost of engineering controls is high
   g. Engineering controls depend on worker interaction to provide protection
   h. Engineering controls should make it hard for employees to defeat

Warnings

Warnings promote employee awareness of hazards. They do not prevent exposure to a hazard, but they do provide a visual, audible, and/or tactile indicator to warn people of potential danger. Greater awareness is gained by using signs, alarms, signals, labels, placards, cones, and other methods. For example, a warning sign might be used to keep workers from entering a confined space.

Administrative Controls

If engineering controls cannot be implemented, or cannot be implemented right away, administrative controls should be considered. These methods for protecting workers have also proven to be less effective than other measures, requiring significant effort by the affected workers. Administrative controls work only so long as employee behavior conforms to standards.

Administrative controls involve changes in workplace policies and procedures. They can include such things as:

- warning alarms
- labeling systems
- reducing the time workers are exposed to a hazard
- training

For example, workers could be rotated in and out of a hot area rather than having to spend eight hours per day in the heat. Back-up alarms are an example of effective warning systems. However, warning signs used instead of correcting a hazard that can and should be corrected are not acceptable forms of hazard control.
4. What is a major weakness in the use of administrative controls to reduce exposure to hazards?

   a. They work only if hazards are replaced first
   b. They are not effective in mitigating hazards
   c. They work only so long as employees comply
   d. They are too expensive to implement during the drilling phase

Personal Protective Equipment

PPE is the last resort and least effective means of controlling exposure to hazards because of the high potential for damage to render PPE ineffective. Again, the success of this control measure depends not only on the quality of the PPE, but also the quality of human behavior.

PPE should be used only while other more effective controls are being developed or installed, or if there are no other more effective ways to control the hazard.

This is because:

   • The hazard is not eliminated or changed.
   • If the equipment is inadequate or fails, the worker is not protected.
   • No personal protective equipment is fool proof (for example, respirators leak).
   • Personal protective equipment is often uncomfortable and can place an additional physical burden on a worker.
   • Personal protective equipment can actually create hazards. For example, the use of respirators for long periods of time can put a strain on the heart and lungs.

While there are some jobs, such as removing asbestos, where wearing adequate personal protective equipment is absolutely essential, there are many jobs where employers hand out personal protective equipment when in fact, they should be using more effective hazard control methods.
5. According to the text, what does the success of using PPE depend on?
   a. Quality of the PPE and barriers
   b. Quality of the PPE and employee behavior
   c. Quantity of safety rules and cost of PPE
   d. Quantity of PPE and mitigation efforts

Other Methods to Prevent and Control Hazards

Let’s take a look at some of the programs and processes that will help the company prevent and control typical hazards on an oil and gas wellsite.

Wellsite Inspections

Your company should conduct daily wellsite inspections. Hazards should be documented, reviewed, and corrections should be made in a timely manner. More detailed, written inspections should be conducted by a designated person on a weekly or monthly basis.

Your company’s Safety Coordinator or other designated safety person should tour each job site and observe potential safety/health hazards, and develop a plan for safeguarding the workers, which may include the following:

- removing the hazard
- guarding against the hazard as required by OSHA
- providing personal protective equipment and enforcing its use
- training workers in safe work practices
- coordinating protection of workers through other contractors

A record of all safety inspections and correctional steps should be kept.

6. How often should walkaround wellsite inspections be conducted?
   a. Daily
   b. Weekly
   c. Monthly
   d. Quarterly
Analyze Accident Investigations

To most effectively prevent future accidents on the wellsite while work is being performed, be sure to investigate and analyze the results of all accidents, including near misses and property damage, occurring at the wellsite. Do not limit your investigations to only those accidents that result in injury.

Investigating non-injury incidents will help prevent similar accidents at the current or future projects. Controlling the hazard that caused a near miss now, can save a life, and a lot of money and time if it helps prevent a future injury accident.

Don’t forget to analyze the data from previous investigations and those investigations conducted at other wellsites.

Control Hazardous Energy

The control of hazardous energy through lockout/tagout procedures assures that you and other employees are protected from unexpected machine motion or release of energy which could cause injury. This includes electricity, water, steam, hydraulic, gravity, and many other sources of stored energy.

All sources of hazardous energy must be shut off, de-energized at the source, and locked-out prior to you or any other employee beginning work around or on the potential hazard.

7. What should the safety professional do to most effectively prevent future accidents on the wellsite?
   a. Make sure someone is reprimanded for every accident
   b. Investigate injury accidents
   c. Investigate and analyze all accidents and incidents
   d. Analyze results of the walkaround inspection

Confined Space Entry

Analyze the project for the potential for confined spaces. Workers should not enter confined spaces without proper training and management authorization.

A confined space is defined as the following:

   a. A space that is NOT DESIGNED FOR CONTINUOUS employee OCCUPANCY, and
b. Is large enough and so configured that a person can bodily enter into and perform assigned work, and

c. Has LIMITED or RESTRICTED means for ENTRY or EXIT.

Confined spaces that may have a HAZARDOUS ATMOSPHERE require special precautions. Hazardous atmospheres are those that may expose employees to the risk of death, incapacitation, and impairment of ability to self-rescue caused by:

- flammable gas
- airborne combustible dust
- atmospheric oxygen concentration below 19.5 or above 23.5%
- a toxic atmosphere or substance
- danger of engulfment

For more information on this topic, take OSHAacademy course 713 Confined Space Program or course 816 Confined Space Safety in Construction.

8. Which of the following would NOT be a hazardous condition within a confined space?

   a. Oxygen concentration of 21%
   b. Airborne combustible dust
   c. Possible engulfment
   d. Nitrogen level of 85%

Analyze Fall Hazards

Each year falls consistently account for the greatest number of fatalities in the oil and gas industry. A number of factors are often involved in falls, including unstable working surfaces, misuse or failure to use fall protection equipment and human error.

Studies have shown that using guardrails, fall arrest systems, safety nets, covers and restraint systems can prevent many deaths and injuries from falls.

Analyze the project to determine if you will be using:

- aerial lifts or elevated platforms to provide safer elevated working surfaces
• guardrail systems with toeboards and warning lines or install control line systems to protect workers near the edges of floors, roofs, and floor holes; and/or
• safety net systems or personal fall arrest systems (body harnesses)

9. What would be one of the fall protection systems used to protect workers near the edges of floors, roofs, and floor holes?
   a. Guardrail systems
   b. Safety nets
   c. Warning signs
   d. Fall restraint systems

Analyze for Excavation Hazards

The primary hazard of trenching and excavation is employee injury from collapse. Soil analysis is important in order to determine appropriate sloping, benching, and shoring.

Additional hazards include working with heavy machinery; manual handling of materials; working in proximity to traffic; electrical hazards from overhead and underground powerlines; and underground utilities, such as natural gas.

10. Which of the following is the primary hazard of trenching and excavation on a project?
   a. Flooding
   b. Soil collapse
   c. Electrical shock
   d. Heat or cold stress

Analyze for Hazardous Chemicals

Analyze the project for the potential for hazardous chemicals requiring a Hazard Communications Program (HCP) to ensure all workers know about the chemicals that they work with and work around. The HCP involves the following elements.

1. written hazard communication program
2. training on the chemicals your company uses
3. labeling using properly labeled containers
4. Safety Data Sheets (SDS): SDS must be readily available onsite. Workers must know where to find SDS and be able to read and properly utilize a SDS.

5. Posting signs to inform employees of the location of SDS and when new chemicals are brought on the job site.

6. Informing other contractors: If using chemicals around other contractors, it is your responsibility to inform the other contractors of the hazards involved. Every effort must be made to keep other contractors safe from the chemicals in use. Typically, the general contractor onsite will need to coordinate all chemical use of all contractors to maintain a safe workplace.

Note: Your written Hazard Communication program should outline the specific details of the elements listed above.

11. Who is typically responsible to coordinate all chemical use on the wellsite?
   a. The HCP competent person
   b. Each subcontractor
   c. The safety officer
   d. The general contractor

Analyze Electrical Hazards

Many oil and gas workers are unaware of the potential electrical hazards present in their work environment, which makes them more vulnerable to the danger of electrocution.

Experts in electrical safety have traditionally looked toward the widely used National Electrical Code (NEC) for help in the practical safeguarding of persons from these hazards.

Electrical safety in oil and gas involves two primary issues:

- powerlines
- temporary and permanent electrical wiring and equipment
12. What is the most common cause of fatalities involving contact with power line?

   a. Use of cranes
   b. Use of metal ladders
   c. Violation of the arc flash approach
   d. Downed power lines
Module 6- Total Safety Education and Training

"Total" safety education and training is a process that gives employees everything they need to know and do to achieve excellent performance. It starts with new employee selection and ends with the verification of sustained excellent performance. Total safety education and training should be a part of every employee's experience because it:

- reinforces the belief that safety is a core value (not a priority) - an essential part of every job;
- identifies safety, requirements, standards, and results;
- helps ensure employees have excellent knowledge, skills, and abilities (KSAs) to work safely; and
- results in more effective and efficient operations, and long-term company success.

The Importance of Total Safety Education and Training

The benefits listed above emphasize the importance of conducting world-class safety education and training that ensures workers are properly selected and oriented, completely trained, evaluated, retrained when necessary, and always motivated be the best. Let's look at some important aspects of the process.

Elements of Total Safety Education and Training

**Selection.** It's important to properly select from a qualified pool of applicants. A well-planned application process will help select qualified employee and that will also improve employee retention.

**Orientation.** A safety orientation will educate new employees on the safety and health aspects of their jobs and will help take the surprise out of first days on the job.

**Training.** Initial and continuing safety training, especially with new employees, must compensate for their lack of knowledge, skills, and abilities in the demanding work they must perform. Accidents can happen quickly at a worksite if roughnecks and others do not understand and have the proper attitudes about the procedures they must follow, and why they are necessary.

**Retraining.** Remaining aware of danger, as familiarity kills caution, requires constant retraining in a variety of ways in order to retain interest. Retraining should be conducted if it appears
workers have adequate knowledge or skills to perform safely, or as needed to ensure that employees are able to perform their tasks in a safe manner.

**Motivation.** Worker motivation to work safely and to stay with the industry must come from the companies. The opportunity to be employed year around, developing pride in working for a good company, experiencing satisfaction with job conditions, knowing that the work is meaningful and being rewarded generously should lessen the movement of workers through the industry.

**Evaluation.** Total safety education and training is successful only after the employer can verify that employees are performing at or above the employer's standards. To achieve that, employees should be evaluated by competent persons.

1. **Why is safety education and training so important, especially for new employees?**
   a. To clearly state what is, and what is not, acceptable behavior
   b. To meet all OSHA safety and health regulations
   c. To compensate for their lack of knowledge, skills, and abilities
   d. To make sure they know what company expectations are

**Initial Training**

When initially employed, a worker should receive instruction and training pertinent to the hazards, safety precautions, safe work practices, and use of personal protective equipment applicable to the type of work performed. The employer should require that the worker demonstrate adequate knowledge, skills, and abilities (KSAs) to safely operate the tool or equipment prior to using it in a drilling situation.

**Elements of Initial Orientation**

The instructions should adequately orient and alert the new employee to the following:

   a. the basic principles of a well drilling operation, including the safe work practices and hazards associated with rig equipment;
   b. the purpose and operation of blowout prevention;
   c. hydrogen sulfide and respiratory protection;
   d. fire prevention and control;
   e. confined spaces and entry procedures;
f. personal protective equipment; and

2. What must employees do before the employer can allow them to use tools or equipment on the wellsite?

   a. Demonstrate ability to safely operate the tool or equipment
   b. Pass a multiple-question test with at least 70% score
   c. Attend a class on safe use of the tool or equipment
   d. Answering any questions the supervisor might have

Ongoing Training

The Safety Coordinator or other designated site safety person will appraise the skill and knowledge level of exposed workers and provide any needed training.

If the worker changes jobs, he or she should once again demonstrate adequate knowledge and ability to correctly perform new procedures and operate any new tools or equipment involved with the procedure.

After inspecting a job site, a designated person should identify and evaluate all potential hazards that may cause serious injuries and increase the probability of an accident. Actions will be taken to minimize the hazards and protect the workers.

Where safety and health training is needed as a result of hazard identified on the worksite, be sure to develop training that at least does the following:

- Describe the hazards that have been identified.
- Explain specific safe practices the necessary precautions.
- Require students to demonstrate competence.

Toolbox Talks: Short toolbox talks (also called tailgate meetings) in which employees gather around informally should be conducted regularly (daily or weekly). Virtually any topic may be included such as:

- Safe work practices necessary for that day's work
- Any safety concerns workers may have
• Brief refresher training on relevant safety topics (topics to be provided by the Safety Coordinator)

Records should be maintained for all training sessions with descriptions of topics covered and names of workers trained. When students learn how to perform safe procedures, be sure to formally certify them as competent and qualified in writing.

3. What should the trainer do after learners complete training in which they learn how to perform hazardous procedures?
   a. Include student signatures on rosters
   b. Complete attendance rosters
   c. Certify attendance
   d. Certify competence and qualification

Classroom and On-The-Job Training

Training Development Process: The Texas Department of Insurance Division of Workers' Compensation Workplace Safety (www.tdi.state.tx.us) has a seven-step classroom training development process that can be quite effective in conducting classroom training for oil and gas companies.

Step #1 - Determine Training Needs

Training does not solve all problems. Sometimes the problem may be work procedures, equipment, or lack of employee motivation. Ask yourself: “Does the employee have the skills or knowledge to perform the job?”

• If the answer is “yes”, then safety training may not be required.

• If the answer is “no”, then safety training will be required.

Safety training should occur if an employee:

• is newly hired

• lacks the knowledge needed to perform safely

• lacks the skills to perform safety
is exposed to hazardous new machinery or equipment

- is exposed to hazardous new procedures or tasks

- is subject to new safety guidelines, policies or rules

**4. Employee safety training should occur for all of the following reasons EXCEPT _____.**

a. exposure to hazardous new machinery or equipment
b. retraining has not been conducted annually
c. a lack of skills to perform safely
d. exposure to hazardous procedures or tasks

**Step #2 - Identify Training Needs**

The purpose of training is to ensure that the employee will be able to perform the job correctly and safely. Some questions to help identify training needs are:

- Does the employee have previous experience?
- Does the employee know how to perform the tasks?
- Does the employee possess the skills to perform the tasks?

Once these questions have been answered, you can look at additional information to help identify specific training that needs to be done. Documents to review include the following:

- accident and injury records
- incident and near miss reports
- audits and inspections
- observing employees while working
- safety meetings
- suggestions from employees
• job hazard analysis and developed solutions for the hazards (this is a very valuable tool to identify training needs)

5. Once you have determined that training is needed, what is the next step?

   a. Determine the training needs
   b. Develop the learning activities
   c. Write the training goals
   d. Develop the learning objectives

Step #3 - Identify Learning Goals and Objectives

After determining training needs, it is time to identify your goals and write objectives. When developing your learning goals and objectives, you should be able to describe what you expect employees to know and be able to perform tasks and improve performance.

Goals. Learning goals are merely statements describing a general end-state result such as:

- Know the types of fall arrest systems.
- How how to perform first aid.

Objectives. Effective learning objectives describe outcomes in terms of specific, observable, and measurable behaviors. They should be based on an objective training needs analysis, not on conjecture or existing trainer guides. Objectives should specify the knowledge, skills, and abilities (KSAs) that make performing a task possible. To make sure learning objectives are clear and concise, we encourage using the ABCS model that includes each of these four components: Audience, Behavior, Condition, and Standard.

Four Components of the ABCS Model

- **Audience.** The objective identifies the **audience.** Example: "**each student**"
- **Behavior.** The objective should describe a **behavior.** The behavior is the "action" component that must be observable and measurable. Example: "**will list**" **More** examples. Each of the following behavioral methods can be used and examples:
  - **Written exam** - answer questions on a written test
  - **Oral exam** - answer questions, give opinions, or describe key elements
Skill demonstration - don/doff PPE, perform steps of a task

- Conditions. The objective should describe the **conditions** under which performance is measured. Example: "**without help**" The student may or may not be assisted as a condition under which they must perform. The condition specifies constraints, limitations, and resources such as tools, working aids, assistance, supervision, and physical environment is given to the learner to perform.

- Standard. The objective should specify an acceptable **standard** of performance. It's important to clearly state how well the student must perform. Establish quantitative and qualitative criteria for acceptable performance.

Here are two examples of learning objectives for safety training:

- Given a full body harness, each student will be able to correctly inspect and identify at least two defects in the equipment.

- Given a 10-question written exam on oil and gas electrical safety, each student will be able to correctly answer at least 8 questions.

As you can see, operational objectives are much more specific and detailed than mere safety goals.

**6. Which of the following is the best example of a learning objective?**

   a. At the end of training the learner will have gained a real appreciation for safety
   b. Each student will complete the training and pass the final exam
   c. When asked, the student will be able to describe all steps in the scaffold erection process
   d. The trainer will have received an excellent evaluation from each student

**Step #4 - Develop Learning Activities**

Decide what types of activities you’re going to use to train your employees. How are you going to get across to them the skills and knowledge they need? Different people require different types of training; some visual, some hands-on, etc. The most common and effective learning activities that ensure students gain adequate KSAs are step-by-step instructor demonstration followed by student practice. Examples include:

- donning and doffing a fall protection harness;
• proper operation of a fire extinguisher; and
• proper use of a portable ladder.

Prepare your training materials and aids after deciding on the learning activities. Arrange objectives and activities in the sequence that corresponds to the tasks actually performed on the job, and if possible, use hands-on demonstrations. Employees will retain training information if it is related to their job tasks.

**Step #5 - Conduct the Training**

The actual training is crucial for the overall safety training process to be successful. Begin your training with a short review of the key training subjects and activities. After each objective is taught, draw a relationship between the employee’s goals, interests, and experiences to the objective. Reinforce what the employee has learned by summarizing objectives and key points.

Make sure employees have an opportunity to participate in hands-on practice in a safe environment. After instruction and practice, the trainer should:

• evaluate each student’s KSAs;
• use the results of the evaluation to verify the student's competency, and
• certify in writing that the student successfully achieved adequate KSAs.

After training is completed, the supervisor should evaluate and certify in writing that the student is qualified to perform the learned task on the job.

<table>
<thead>
<tr>
<th>7. Which learning method is used most effectively ensure students gain adequate KSAs?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Lecture and Simulation</td>
</tr>
<tr>
<td>b. Demonstration followed by practice</td>
</tr>
<tr>
<td>c. Video case studies</td>
</tr>
<tr>
<td>d. Role playing by the trainer</td>
</tr>
</tbody>
</table>

**Step #6 - Evaluate the Program**

After conducting the training and receiving feedback from students, it’s time to evaluate the success of the trainer and the training. Safety training is successful only if workers learn from it, and gain adequate knowledge, skills, and abilities (KSAs).
Without evaluation, you will never know the degree to which the training was successful. When you develop the goals, learning objectives, and content of the training, don't forget to include a process to evaluate both the trainer and the training.

The training evaluation can be conducted using several methods, including:

- student surveys can provide the most useful feedback about the effectiveness of the trainer and the training;
- supervisor observation of the student on the job to determine improvement in KSAs after the training; and
- statistical data that establishes before-after changes in key performance indicators (KPIs).

Survey Questions

- Were parts of the content already known and, therefore, unnecessary?
- What material was confusing or distracting?
- Was anything missing from the program?
- What did the employees learn, and what did they fail to learn?
- If a job analysis was conducted, was it accurate?
- Was any critical feature of the job overlooked?
- Were the important gaps in knowledge and skill included?
- Was material already known by the employees intentionally omitted?
- Were the instructional objectives presented clearly and concretely?
- Did the objectives state the level of acceptable performance that was expected of employees?
- Did the learning activity simulate the actual job?
• Was the learning activity appropriate for the kinds of knowledge and skills required on the job?

• When the training was presented, was the organization of the material and its meaning made clear?

• Were the employees motivated to learn?

• Were the employees allowed to participate actively in the training process?

• Was the employer's evaluation of the program thorough?

8. Which of the following training evaluation methods can provide the most useful feedback about the effectiveness of the trainer and the training?

   a. Student surveys  
   b. Observations  
   c. Review of statistics  
   d. Management feedback

Step #7 - Program Improvement

After asking the questions in the survey above, you may discover that one or more improvements can be made. If so, it's important to carefully develop and implement the change through effective change management principles.

By following a simple 4-step process, called the PDSA Cycle, small improvements can be continually in the training program, or any other program, no matter how large or small.

The PDSA Cycle uses a systematic series of steps to continually improve a product or process. The process is called a "cycle" because the steps are continually repeated. As the image to the right shows, the PDSA Cycle contains four primary steps. These four steps are repeated over and over as part of a never-ending cycle of continual improvement.

Let's see how we can apply these steps to develop a safe work procedure:

1. **Plan.** In this step, we identify a safety process or plan of action.

2. **Do.** We implement the change on a small, such as a change in some part of a training course. We keep it small scale to limit the negative effects if the change fails.
3. **Study.** We carefully study the plan to check the progress of the test see if it's working.

4. **Act.** In this step we take the information from the previous step to either adopt the change, revise it (by going through the cycle again), or we abandon it.

In the example above:

- If the new safety training works, we keep it
- If the training needs improvement, we continue the cycle making small changes
- If the training does not work at all, we throw it out and start over.

9. **Using the PDSA Cycle, it's important that changes in a training program small scale to**

   a. determine the failure more quickly
   b. better identify who to blame for the failure
   c. save the costs of the change
   d. limit the negative effects

---

**A Simple Seven Step On-The-Job Training (OJT) Process**

Safety training should be simple training. It should be done where the task is performed, and hopefully the supervisor is conducting the training. Here is a seven-step OJT training process that helps to ensure new employees don't get hurt while being trained. Now I know that might sound funny, but it happens regularly.

**Step 1 - Introduction:** State and discuss the learning objectives and answer any questions the employee may have. Discuss the acceptable standards of knowledge and performance. Tell the trainee what you're going to train. Emphasize the importance of the procedure to the success of the production/service goals.

**Step 2 – Trainer explains and performs- learner observes:** In this step the trainee becomes familiar with each work practice and why it is important. Review the initial conditions for the procedure. Demonstrate the process, carefully explaining each step as you go. Answer questions and continue to demonstrate and explain until the employee understands what to do, when and why to do it, and how to do it.
**Step 3 - Learner tells – Trainer Performs:** This step is necessary when exposure to hazards inherent in the procedure could cause serious harm. It protects the trainee because the trainer performs the procedure. The trainee explains the procedure to the trainer, while the trainer does it.

10. In the 7-Step OJT model, what does the trainer do after a learner successfully describes a step in a hazardous task?
   a. The learner performs the step
   b. The trainer will perform the step
   c. The trainer watches as the learner performs the step
   d. The trainer tells the learner to explain the next step

**Step 4 - Learner Explains and Performs:** This step is an optional precaution that may be used when exposure to hazards inherent in the procedure could cause an injury. The learner explains the step, gets permission to perform the step and then performs the step. This step is very important when training tasks that might result in serious physical injury or death if not performed correctly.

**Step 5 - Conclusion: Recognize accomplishment:** "Good job!" Reemphasize the importance of the procedure and how it fits into the overall process. Tie the training again to accountability by discussing the natural and system consequences of performance.

**Step 6 - Document:** Training documentation should be more than an attendance sheet. See the sample training certification document on the next page. It represents one possible way to document training.

**Step 7 - Validate:** At some point in time after the conclusion of the OJT session, observe and question the employee to validate that the training has been successful and that the employee has developed a proper attitude related to the work.

You can learn more about how to conduct a JHA in OSHAcademy Course 706.

**Training Requirements in OSHA Standards and Training Guidelines** (OSHA's Training Requirements Guide) Here’s a great booklet that covers many OSHA training requirements and also gives you some ideas on training strategies.
11. In the 7-Step OJT model, what is a precaution the trainer takes to ensure the learner does not get injured prior to performing a step?

   e. Only the "safe" steps are performed
   f. The trainer first performs the steps
   g. The learner does not perform any of the steps
   h. The learner must get permission to perform the step

Observations

Safety and health work observations should be performed periodically by supervisors or designated observers. Observations may be conducted randomly in an informal program, or they may be planned when a formal observations program (Behavior Based Safety Program) is part of the SMS.

Electrical safety in oil and gas involves two primary issues:

- an employee has the knowledge to perform the work as trained
- the employee is actually performing their work task safely

Specific observations or audits are especially critical for lockout/tagout, confined space, fall protection and other programs where the risk of exposure to hazards is high. Results should be documented, and follow-up training should be provided as needed. This process helps assure safety and health training is effective.

To learn more about safety education and training, be sure to complete OSHA academy Courses 703, 721, and 723.

12. Specific observations are especially critical for which of the following procedures?

   a. Safety committee meetings
   b. Lockout/Tagout
   c. Job hazard analysis
   d. Safety inspections
Module 7- Getting Started

Steps to Identify OSHA Requirements

Follow the steps below to identify the major OSHA oil and gas requirements and guidance materials that may apply to your jobsite.

These steps will lead you to resources on OSHA's website that will help you comply with OSHA requirements and prevent workplace injuries and illnesses.

- **Step 1:** OSHA Requirements Related to Leading Hazards at Oil and Gas Sites
- **Step 2:** Other OSHA Requirements That May Apply to Your Jobsite
- **Step 3:** Survey Your Workplace for Additional Hazards
- **Step 4:** Develop a Jobsite Safety and Health Program
- **Step 5:** Train Your Employees
- **Step 6:** Recordkeeping, Reporting and Posting
- **Step 7:** Find Additional Compliance Assistance Information

**Step 1: OSHA Requirements Related to Leading Hazards at Oil and Gas Sites**

The following resources will introduce you to OSHA requirements that address some of the leading hazards at oil and gas sites.

Falls consistently account for the greatest number of fatalities in the oil and gas industry. If you have employees who work six or more feet above a lower level, you must provide fall protection.

- Read a fact sheet. OSHA Fact Sheet: [Preventing Falls in Oil and Gas](https://www.osha.gov/Publications/preventing-falls-oil-gas.pdf).
  Also available as a 1 MB [PDF](https://www.osha.gov/Publications/preventing-falls-oil-gas.pdf) - 353 KB

- Read the standards.
  - 29 CFR 1926 Subpart M

- Review fall protection information for specific operations or types of oil and gas:
• Residential oil and gas. OSHA Fall Protection in Residential Oil and gas

• Steel erection. OSHA Oil and gas eTool: Steel Erection - Fall Protection

• Learn more:
  
  o OSHA Safety and Health Topics Page: Fall Protection
  
  o OSHA Campaign to Prevent Falls in Oil and Gas
  
  o OSHA Oil and gas eTool: Falls
  
  o OSHA Pocket Guide: Oil and Gas. OSHA Publication 3252 (2005). Also available as a 288 KB PDF.

Stairways and Ladders: Working on and around stairways and ladders can be hazardous. Stairways and ladders are major sources of injuries and fatalities among oil and gas workers.

• Review an OSHA booklet. Stairways and Ladders. OSHA Publication 3124 (2003). Also available as a 156 KB PDF.

• Read the standards.
  
  o 29 CFR 1926 Subpart X
  
  o OSHA Safety and Health Topics Page: Walking/Working Surfaces - OSHA Standards

• Learn more:
  
  o OSHA Safety and Health Topics Page: Walking/Working Surfaces
  
  o OSHA Oil and gas eTool: Misuse of Portable Ladders

Scaffolding: Do you use scaffolding on your jobsite?

• Review an OSHA booklet. A Guide to Scaffold Use in the Oil and gas Industry. OSHA Publication 3150 (2002). Also available as a 2 MB PDF.

• Read the standards.
  
  o 29 CFR 1926 Subpart L
Electrical: Almost all oil and gas employers must consider the hazards associated with electricity (i.e., electric shock, electrocution, fires and explosions).

- Review OSHA booklets:
  - Controlling Electrical Hazards. OSHA Publication 3075 (2002)

- Read the standards.
  - 29 CFR 1926 Subpart K
  - OSHA Safety and Health Topics Page: Electrical - Standards

- Learn more:
  - OSHA Safety and Health Topics Page: Electrical
  - OSHA Oil and gas eTool: Electrical Incidents

Trenching and Excavation are among the most hazardous oil and gas operations.


- Read a fact sheet. OSHA Fact Sheet: Trenching and Excavation Safety: English [PDF - 249 KB] and Spanish [PDF - 282 KB]


- Review an OSHA booklet. Excavations, OSHA Publication 2226 (2002). Also available as a 536 KB PDF.
• Read the standards.
  o 29 CFR 1926 Subpart P
  o OSHA Safety and Health Topics Page: Trenching and Excavation - Oil and gas

• Learn more:
  o OSHA Safety and Health Topics Page: Trenching and Excavation - Oil and gas
  o OSHA Oil and gas eTool: Trenching and Excavation
  o OSHA Technical Manual Chapter: Excavations - Hazard Recognition in Trenching and Shoring

Motor Vehicle Safety/Highway Work Zones: Do you operate motor vehicles on your jobsite or do your employees work in and around highway work zones?

• Read a fact sheet. OSHA Fact Sheet: Work Zone Traffic Safety [PDF* - 21 KB]

• Read the standards.
  o 29 CFR 1926 Subpart O, 29 CFR 1926 Subpart G
  o OSHA Safety and Health Topics Page: Motor Vehicle Safety - Oil and gas

• Learn more:
  o OSHA Safety and Health Topics Page: Motor Vehicle Safety - Oil and gas
  o OSHA Safety and Health Topics Page: Oil and gas - Highway Work Zones and Signs, Signals and Barricades
  o OSHA Oil and gas eTool: Vehicles

NOTE: Most oil and gas jobsites involve multiple employers (i.e., general contractors, oil and gas managers, subcontractors, etc.). If you perform work on such jobsites, you should review OSHA's Multi-Employer Citation Policy.
Step 2: Other OSHA Requirements That May Apply to Your Jobsite

In addition to the OSHA requirements covered in Step 1, a number of other OSHA standards may apply to your jobsite. The following items can help you identify other key OSHA standards that may apply and point you to information to help you comply with those standards.

**Personal Protective Equipment (PPE):** OSHA oil and gas standards (see 29 CFR 1926.28 and 1926.95) state that employers must require their employees to wear appropriate PPE in all operations where employees are exposed to hazardous conditions or where OSHA's oil and gas standards indicate the need for using PPE to reduce the hazards.

- Read a fact sheet. OSHA Fact Sheet: [Personal Protective Equipment](#) [PDF* - 293 KB]
- Watch videos.
- Review an OSHA booklet. [Personal Protective Equipment](#), OSHA Publication 3151 (2004). Also available as a 632 KB [PDF](#).
- Read the standards.
  - [29 CFR 1926 Subpart E](#)
  - [OSHA Safety and Health Topics Page: Personal Protective Equipment (PPE) - Oil and gas](#)
- Learn more
  - [OSHA Safety and Health Topics Page: Personal Protective Equipment (PPE)](#)
  - [OSHA Safety and Health Topics Page: Respiratory Protection](#)

**Hand and Power Tools:** Hand and power tools are common at nearly every oil and gas jobsite.

- Review an OSHA booklet.
  - [Hand and Power Tools](#), OSHA Publication 3080 (2002). Also available as a 172 KB [PDF](#).
Do you use concrete or masonry products on your jobsite?

- Review OSHA booklets.
  - Concrete and Masonry Oil and Gas. OSHA Publication 3106 (1998). Also available as a 415 KB PDF.
  - Preventing Skin Problems from Working with Portland Cement. OSHA Publication 3351 (2008). Also available as a 324 KB PDF.

Do you use cranes, derricks, hoists, elevators, or conveyors on your jobsite?

- Read a fact sheet on the revised standard. OSHA Fact Sheet: Cranes and Derricks in Oil and gas Final Rule

- Review OSHA booklets and guidance documents:
  - Small Entity Compliance Guide for Final Rule for Cranes and Derricks in Oil and gas. OSHA Publication 3433 (2011). Also available as a 366 KB PDF.
Do you conduct welding, cutting, or brazing at your jobsite?

- Read the standards.
  - 29 CFR 1926 Subpart J
  - OSHA Safety and Health Topics Page: Welding, Cutting, and Brazing - OSHA Standards

- Learn more. OSHA Safety and Health Topics Page: Welding, Cutting, and Brazing

Are you engaged in residential oil and gas?

- Review an OSHA booklet. Selected Oil and gas Regulations for the Home Building Industry

- Read the standards. OSHA Safety and Health Topics Page: Residential Oil and gas Industry - OSHA Standards

- Learn more.
  - OSHA Safety and Health Topics Page: Residential Oil and gas Industry
Are you engaged in steel erection?

- Review a slide presentation. [OSHA Steel Erection Overview Presentation](#)
- Read the standards. [29 CFR 1926 Subpart R](#)
- Learn more:
  - [OSHA Safety and Health Topics Page: Steel Erection](#)
  - [OSHA Oil and gas eTool: Steel Erection](#)

**Fire Safety and Emergency Action Planning:** Oil and gas employers are responsible for the development and maintenance of an effective fire protection and prevention program at the jobsite throughout all phases of the oil and gas, repair, alteration, or demolition work. ([29 CFR 1926.24](#)). OSHA recommends that all employers have an emergency action plan. A plan is mandatory when required by an OSHA standard. ([29 CFR 1926.35](#)). An emergency action plan describes the actions employees should take to ensure their safety in a fire or other emergency situation.

What if I still have questions?

- Review a publication that lists the requirements for emergency response and preparedness in OSHA's oil and gas standards. [Principal Emergency Response and Preparedness - Requirements and Guidance](#). OSHA Publication 3122 (2004). Also available as a 620 KB [PDF](#).
- Read the standards.
  - [29 CFR 1926 Subpart F](#)
  - [OSHA Safety and Health Topics Page: Fire Safety - Standards](#)
- Learn more. [OSHA Safety and Health Topics Page: Fire Safety](#)

**Hazard Communication Standard:** This standard is designed to ensure that employers and employees know about hazardous chemicals in the workplace and how to protect themselves. Employers with employees who may be exposed to hazardous chemicals in the workplace must
prepare and implement a written Hazard Communication Program and comply with other requirements of the standard, including providing Material Data Safety Sheets, training, and labeling.


- See a sample program. [Model Plans and Programs for the OSHA Bloodborne Pathogens and Hazard Communications Standards](#). OSHA Publication 3186 (2003). Also available as a 520 KB PDF.

- Read the standards.
  - [OSHA Safety and Health Topics Page: Hazard Communication - OSHA Standards](#)

- Learn more. [OSHA Safety and Health Topics Page: Hazard Communication](#)

The previous list is not comprehensive - additional OSHA standards may apply to your workplace. In addition, section 5(a)(1) of the Occupational Safety and Health Act, known as the General Duty Clause, requires employers to provide their employees with a workplace that is free of recognized hazards likely to cause death or serious physical harm. Be sure to review OSHA's oil and gas standards (29 CFR 1926) for requirements that may apply to your workplace.

- You may review and print FREE copies of OSHA's oil and gas standards from OSHA's Website. You may also order bound volumes of the standards from the Government Printing Office (GPO) at (866) 512-1800 or from [GPO's website](#).

- An OSHA booklet summarizes OSHA oil and gas standards that are most frequently overlooked by employers and standards that cover particularly hazardous situations. [Oil and gas Industry Digest](#). OSHA Publication 2202-09R, (2011).

- The OSHA [Oil and gas Resource Manual](#) includes links to the relevant mandatory standards for oil and gas work that have been codified in OSHA's standards, including 29 CFR Parts 1903, 1904, 1910, and 1926.

**Step 3: Survey Your Workplace for Additional Hazards**
Survey your workplace for additional hazards by:

- Using oil and gas safety checklists. OSHA Pocket Guide: Oil and gas. OSHA Publication 3252 (2005). Also available as a 288 KB PDF.

- Reviewing OSHA's Safety and Health Information Bulletins (see the Oil and gas Operations section).

Find information on workplace safety and health hazards, such as:

- Asbestos
  - Asbestos Safety and Health Topics Page
  - Asbestos Expert Advisor
- Asphalt Fumes. OSHA Safety and Health Topic.
- Carbon Monoxide
  - OSHA Fact Sheet [PDF* - 68 KB]
  - NIOSH Alert: Preventing Carbon Monoxide Poisoning From Small Gasoline-Powered Engines and Tools
- Distracted Driving. OSHA Web Page
- Hazardous and Toxic Substances. OSHA Safety and Health Topics Page
- Heat
  - Heat Illness Prevention. OSHA Web Page
  - Occupational Heat Exposure. OSHA Safety and Health Topics Page
- Laser Hazards - Oil and gas. OSHA Safety and Health Topics Page
- Lead - Oil and gas. OSHA Safety and Health Topics Page
- Occupational Noise Exposure - Oil and gas. OSHA Safety and Health Topics Page
Recognized and Foreseeable Hazards

When conducting the wellsite analysis, it's important to look for hazards that are generally recognized within the oil and gas industry. OSHA will require that recognized hazards which are generally foreseeable on the wellsite are properly eliminated or controlled.

“Recognized” Hazards

As described in OSHA's Field Operations Manual, recognition of a hazard is established on the basis of industry recognition, employer recognition, or "common sense" recognition criteria.

- **Industry Recognition**: A hazard is recognized if the employer's industry recognizes it. Recognition by an industry, other than the industry to which the employer belongs, is generally insufficient to prove industry recognition. Although evidence of recognition by the employer's specific branch within an industry is preferred, evidence that the employer's industry recognizes the hazard may be sufficient.

- **Employer Recognition**: A recognized hazard can be established by evidence of actual employer knowledge. Evidence of such recognition may consist of written or oral statements made by the employer or other management or supervisory personnel.

- **Common Sense Recognition**: If industry or employer recognition of the hazard cannot be established, recognition can still be established if it is concluded that any reasonable person would have recognized the hazard. This argument is used by OSHA only in flagrant cases. Note: Throughout our courses we argue that "common sense" is a dangerous concept in safety. Employers should not assume that accidents in the wellsite are the result of a lack of common sense.

Step 4: Develop a Jobsite Safety and Health Program

OSHA's oil and gas standards require oil and gas employers to have accident prevention programs that provide for frequent and regular inspection of the jobsites, materials, and equipment by competent persons designated by the employers. See 29 CFR 1926.20(b).

NOTE: OSHA's Oil and gas Focused Inspection Policy recognizes the efforts of responsible contractors who have implemented effective safety and health programs, and encourages other contractors to adopt similar programs. Contractors who have implemented effective
programs are eligible for focused inspections, should they be visited by an OSHA inspector. Focused inspections, which are narrower in scope than comprehensive inspections, target the leading oil and gas hazards. See [Focused Inspections in Oil and Gas](#).

For help in developing a program:

- Use an online tool. [OSHA Oil and gas eTool: Safety & Health Program Component](#)
- Find more help to create your own program. [OSHA eTool: Safety and Health Management Systems](#)
- Request a free on-site consultation. [OSHA On-site Consultation Program](#)
- Learn more. [OSHA Injury and Illness Prevention Programs](#)

**Step 5: Train Your Employees**

Learn about OSHA requirements and resources for training oil and gas workers by:

- Reading the general safety training and education requirement in OSHA’s oil and gas standards. See [29 CFR 1926.21](#).
- Reviewing the specific training requirements in OSHA’s oil and gas standards. [Training Requirements in OSHA Standards and Training Guidelines](#). OSHA Publication 2254 (1998). Also available as a 724 KB [PDF](#).
- Downloading [OSHA 10-Hour Oil and gas Industry Outreach-Trainer Presentations](#).
- Visiting [OSHA’s Training and Reference Materials Library](#) page.
- Watching [OSHA videos](#) on reducing oil and gas hazards.
- Review OSHA's [oil and gas-related Spanish-language material](#).

**Step 6: Recordkeeping, Reporting and Posting**

- **Recordkeeping:** OSHA generally requires oil and gas employers to keep records of workplace injuries and illnesses ([29 CFR 1904](#)). If you had 10 or fewer employees during all of the last calendar year ([29 CFR 1904.1](#)), you are exempt from the recordkeeping requirements (unless asked to do so in writing by OSHA or the Bureau of Labor Statistics).
• **Reporting**: OSHA requires all employers, regardless of size or industry, to report the work-related death of any employee or hospitalizations of three or more employees. Read about OSHA’s reporting requirements (29 CFR 1904.39).

• **OSHA Poster**: All employers must post the OSHA Poster (or state plan equivalent) in a prominent location in the workplace. Where employers are engaged in activities that are physically dispersed, such as oil and gas, the OSHA Poster must be posted at the location to which employees report each day (see 29 CFR 1903.2).

• **Access to Employee Exposure and Medical Records**: An OSHA standard (29 CFR 1910.1020) requires employers to provide employees, their designated representatives, and OSHA with access to employee exposure and medical records.

  **NOTE**: If your workplace is in a state operating an OSHA-approved state program, state plan recordkeeping regulations, although substantially identical to federal ones, may have some more stringent or supplemental requirements, such as for reporting of fatalities and catastrophes. Contact your state program directly for additional information.

**Step 7: Find Additional Compliance Assistance Information**

Where can I find additional information targeted to the oil and gas industry?

• Visit OSHA’s **Oil and gas Industry page**.

Where can I find a collection of OSHA resources designed for smaller employers?

• Visit OSHA’s **Small Business page** and learn about **OSHA's On-site Consultation Program**.

Where can I find resources for Spanish-speaking employees?

• Learn about **OSHA's Spanish-language resources** and visit OSHA's **Spanish-language web site**.

• Review OSHA's **oil and gas-related Spanish-language material**.

Where can I find information on employing teenage or young workers?

• Visit **OSHA's Young Workers page**.

Where can I find information on musculoskeletal disorders at the workplace?
• Visit OSHA's **Ergonomics Safety and Health Topics page**. While this page is not specific to the oil and gas industry, it includes some information targeted to oil and gas, such as an eTool (**Ergonomic Solutions for Electrical Contractors**) and an **Ergonomics Success Story** about an oil and gas company.

Has OSHA developed any compliance assistance information targeted for my specific oil and gas industry?

• Learn about OSHA's **industry-specific resources for oil and gas**.

How can I find OSHA's guidance on preparing workplaces for pandemic influenza?

• Visit **OSHA's Pandemic Influenza Safety and Health Topics Page**.

How do I find out about OSHA's voluntary programs and other ways to work cooperatively with OSHA?

• Learn about OSHA's **Cooperative Programs**.

• Review OSHA's **oil and gas-related Alliances**.

• Find out about ways to participate in OSHA's Voluntary Protection Programs (VPP), including **Mobile Workforce** and the Star Demonstration Program for **Resident Contractors at Non-Voluntary Protection Program Wellsites**.

What if I still have questions?

• Search the OSHA web site. Check the **site index** and the **search** page.

• Call the **OSHA 800 Number**, (800) 321-OSHA (6742).

• Submit a question to OSHA by **e-mail**.

• Contact your local **OSHA office** or **state plan office**.

• Request a free **on-site consultation**.

**Good news!** You don’t need to take a quiz for this module. Please go online and take the final exam for this course when you are ready!
Endnotes

