

# *Occupational Safety & Health Administration*

Created by:

[Occupational Safety and Health Act of 1970,](#)

to ensure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.



# ***OSHA – Workers Rights***

Workers are entitled to working conditions that do not pose a risk of serious harm. To help assure a safe and healthful workplace, OSHA also provides workers with the right to:

- Receive information and training about hazards, methods to prevent harm, and the OSHA standards that apply to their workplace. The training must be in a language you can understand;
- Observe testing that is done to find hazards in the workplace and get test results;
- Review records of work-related injuries and illnesses;
- Get copies of their medical records;
- Request OSHA to inspect their workplace; and
- Use their rights under the law free from retaliation and discrimination

# ***OSHA – Employer’s Responsibilities***

Employers have the responsibility to provide a safe workplace.

- MUST provide their employees with a workplace that does not have serious hazards and follow all OSHA safety and health standards.
- Find and correct safety and health problems
- Requires that employers have to try to eliminate or reduce hazards first by making changes in working conditions rather than just relying on masks, gloves, ear plugs or other types of personal protective equipment (PPE).
- Switching to safer chemicals, enclosing processes to trap harmful fumes, or using ventilation systems to clean the air are examples of effective ways to get rid of or minimize risks.

# ***OSHA***

- OSHA protects workers who complain to their employer, OSHA, or other government agencies about unsafe or unhealthful working conditions in the workplace or environmental problems. You cannot be transferred, denied a raise, have your hours reduced, be fired, or punished in any other way because you used any right afforded to you under the OSHA Act

# Acronyms

NIOSH – National Institute for Occupational Safety and Health

SIC – Standard Industrial Classification

REL – Recommended Exposure Limit (NIOSH limit)

PEL – Permissible Exposure Limit (OSHA Limit)

IDLH – Immediately Dangerous to Life and Health (OSHA Limit)

MSDS – Material Safety Data Sheet

# OSHA Standards

- Frequently Cited OSHA Standards are available by SIC Code
- Primary Oil & Gas SIC Codes are:
  - 131 - Crude petroleum and natural gas
    - [1311](#) - Crude petroleum and natural gas ([SIC description](#))
  - 138 - Oil and gas field services
    - [1381](#) - Drilling oil and gas wells ([SIC description](#))
    - [1382](#) - Oil and gas field exploration services ([SIC description](#))
    - [1389](#) - Oil and gas field services, not elsewhere classified ([SIC description](#))

\* SIC(Standard Industrial Classification)

# SIC Code:

## 1311 Crude Petroleum and Natural Gas

Establishments primarily engaged in operating oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operation of separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This industry includes the production of oil through the mining and extraction of oil from oil shale and oil sands and the production of gas and hydrocarbon liquids through gasification, liquid fraction, and pyrolysis of coal at the mine site. Also included are establishments which have complete responsibility for operating oil and gas wells for others on a contract or fee basis. Establishments primarily engaged in performing oil field services for operators on a contract or fee basis are classified in Industry Group 138. Coal gasification at the mine site

- Coal liquefaction at the mine site
- Coal pyrolysis at the mine site
- Crude oil production
- Crude petroleum production
- Kerogen processing
- Natural gas production
- Oil sand mining
- Oil shale mining
- Tar sands mining

# Highlighted Standards

Generally the Oil and Gas Industry have to meet the following OSHA standards

- General Industry ([29 CFR 1910](#))
  - [1910 Subpart D](#), Walking-working surfaces
    - [1910.22](#), General requirements [[related topic page](#)]
    - [1910.23](#), Guarding floor and wall openings and holes [[related topic page](#)]
    - [1910.24](#), Fixed industrial stairs
    - [1910.27](#), Fixed ladders
  - [1910 Subpart E](#), Exit routes, emergency action plans, and fire prevention plans [[related topic page](#)]
    - [1910.36](#), Design and construction requirements for exit routes
    - [1910.37](#), Maintenance, safeguards, and operational features for exit routes
  - [1910 Subpart F](#), Powered platforms, manlifts, and vehicle-mounted work platforms
    - [1910.66](#), Powered platforms for building maintenance
      - [Appendix C](#), Personal fall arrest system (section I - mandatory; sections II and III - non-mandatory)



# Highlighted Standards

- [1910 Subpart G](#), Occupational health and environment control
  - [1910.95](#), Occupational noise exposure. Note: In 1910.95 (O) it states: "Paragraphs (c) through (n) of this section shall not apply to employers engaged in oil and gas well drilling and servicing operations."
- [1910 Subpart H](#), Hazardous materials
  - [1910.106](#), Flammable and combustible liquids
  - [1910.110](#), Storage and handling of liquefied petroleum gases
  - [1910.120](#), Hazardous waste operations and emergency response
- [1910 Subpart I](#), Personal protective equipment
  - [1910.132](#), General requirements [[related topic page](#)]
  - [1910.133](#), Eye and face protection
  - [1910.134](#), Respiratory protection [[related topic page](#)]
  - [1910.135](#), Head protection
  - [1910.136](#), Occupational foot protection
- [1910 Subpart J](#), General environmental controls
  - [1910.141](#), Sanitation
  - [1910.145](#), Specifications for accident prevention signs and tags
  - [1910.146](#), Permit-required confined spaces [[related topic page](#)]
  - [1910.147](#), The control of hazardous energy (lockout/tagout) [[related topic page](#)]
    - [Appendix A](#), Typical minimal lockout procedures
  - [1910.151](#), Medical services and first aid [[related topic page](#)]

# Highlighted Standards

- [1910 Subpart L](#), Fire protection
  - [1910.157](#), Portable fire extinguishers [[related topic page](#)]
  - [1910.165](#), Employee alarm systems
- [1910 Subpart N](#), Materials handling and storage
  - [1910.176](#), Handling materials - general
  - [1910.178](#), Powered industrial trucks
  - [1910.184](#), Slings
- [1910 Subpart O](#), Machinery and machine guarding
  - [1910.212](#), General requirements for all machines
  - [1910.215](#), Abrasive wheel machinery
  - [1910.219](#), Mechanical power-transmission apparatus
- [1910 Subpart P](#), Hand and portable powered tools and other hand-held equipment
  - [1910.242](#), Hand and portable powered tools and equipment, general
- [1910 Subpart Q](#), Welding, cutting, and brazing
  - [1910.252](#), General requirements [[related topic page](#)]
  - [1910.253](#), Oxygen-fuel gas welding and cutting

# Highlighted Standards

- [1910 Subpart S](#), Electrical
  - [1910.303](#), General requirements [[related topic page](#)]
  - [1910.304](#), Wiring design and protection
  - [1910.305](#), Wiring methods, components, and equipment for general use
  - [1910.307](#), Hazardous (classified) locations
  - [1910.332](#), Training
  - [1910.333](#), Selection and use of work practices
  - [1910.334](#), Use of equipment
  - [1910.335](#), Safeguards for personnel protection
- [1910 Subpart Z](#), Toxic and hazardous substances [[related topic page](#)]
  - [1910.1000](#), Air contaminants
  - [1910.1030](#), Bloodborne pathogens
  - [1910.1200](#), Hazard communication [[related topic page](#)]

# Some Potential Hazards and Their Sources

Hazard	Source
Struck by	Falling/moving pipe; tongs and/or spinning chain, kelly, rotary table, etc.; high pressure hose connection failure causing employees to be struck by whipping hose; tools/debris dropped from elevated location in rig; vehicles
Caught in/Between	Collars and tongs, spinning chain, and pipe; clothing gets caught in rotary table/drill string
Fire/Explosion/High Pressure release	Well blowout, drilling/tripping out/swabbing etc. results in release of gas which might be ignited if not controlled at the surface; welding/cutting near combustible materials, uncontrolled ignition sources near the well head, e.g., heater in the doghouse, unapproved or poorly maintained electrical equipment; aboveground detonation of perforating gun
Rig Collapse	Overloading beyond the rated capacity of the rig; improper anchoring/guying; improper raising and lowering the rig; existing maintenance issues with the rig structure which impacts the integrity
Falls	Fall from elevated areas of the rig, i.e., stabbing board, monkey board, ladder, etc.; fall from rig floor to grade
Hydrogen Sulfide (H <sub>2</sub> S) Exposure	H <sub>2</sub> S release during drilling, swabbing, perforating operations, etc. resulting in employee exposures; production tank gauging operations, gaugers sometimes exposed to H <sub>2</sub> S

# Hydrogen Sulfide (H<sub>2</sub>S)

<b>Synonyms &amp; Trade Names</b> Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen					
<b>CAS No.</b> 7783-06-4		<b>RTECS No.</b> <a href="#">MX1225000</a>		<b>DOT ID &amp; Guide</b> 1053 <a href="#">117</a>	
<b>Formula</b> H <sub>2</sub> S		<b>Conversion</b> 1 ppm = 1.40 mg/m <sup>3</sup>		<b>IDLH</b> 100 ppm See: <a href="#">7783064</a>	
<b>Exposure Limits</b> <b>NIOSH</b> : C 10 ppm (15 mg/m <sup>3</sup> ) [10-minute] <b>OSHA PEL</b> †: C 20 ppm 50 ppm [10-minute maximum peak]				<b>Measurement Methods</b>  <b>NIOSH</b> <a href="#">6013</a> ; <b>OSHA</b> <a href="#">ID141</a> See: <a href="#">NMAM</a> or <a href="#">OSHA Methods</a>	
<b>Physical Description</b> Colorless gas with a strong odor of rotten eggs. [Note: Sense of smell becomes rapidly fatigued & can NOT be relied upon to warn of the continuous presence of H <sub>2</sub> S. Shipped as a liquefied compressed gas.]					
<b>MW:</b> 34.1	<b>BP:</b> -77°F	<b>FRZ:</b> -122°F	<b>Sol:</b> 0.4%	<b>VP:</b> 17.6 atm	<b>IP:</b> 10.46 eV
	<b>Fl.P:</b> NA (Gas)	<b>UEL:</b> 44.0%	<b>LEL:</b> 4.0%	<b>RGasD:</b> 1.19	
Flammable Gas					

# Hydrogen Sulfide (H<sub>2</sub>S)

## Incompatibilities & Reactivities

Strong oxidizers, strong nitric acid, metals

## Exposure Routes

inhalation, skin and/or eye contact

## Symptoms

irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite

## Target Organs

Eyes, respiratory system, central nervous system

## Personal Protection/Sanitation

[\(See protection codes\)](#)

**Skin:** Frostbite

**Eyes:** Frostbite

**Wash skin:** No recommendation

**Remove:** When wet (flammable)

**Change:** No recommendation

**Provide:** Frostbite wash

## First Aid

[\(See procedures\)](#)

**Eye:** Frostbite

**Skin:** Frostbite

**Breathing:** Respiratory support

# Respirator Recommendations

## **NIOSH**

### **Up to 100 ppm:**

(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern

(APF = 10) Any supplied-air respirator\*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

### **Emergency or planned entry into unknown concentrations or IDLH conditions:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

### **Escape:**

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern

Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection](#)

# Top 10 OSHA Violations Cited

Standard	# Cited	# Insp.	Description
1910.1200	62	35	Hazard Communication
1910.146	54	10	Permit-Required Confined Spaces
5(a)(1)	52	40	General Duty Clause (Section of OSHA Act)
1910.132	42	30	Personal Protective Equipment, General
1910.305	42	24	Wiring Methods, Components, and Equip. for General Use
1910.23	40	31	Guarding Floor & Wall Openings & Holes
1910.134	39	11	Respiratory Protection
1910.151	37	34	Medical Services & First Aid
1910.141	33	27	Sanitation

**Source:** IMIS Database - FY 2005 (Federal only).



# Hazard Communication

In order to ensure chemical safety in the workplace, information must be available about the identities and hazards of the chemicals. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of such information:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and
- Prepare labels and material safety data sheets (MSDSs) to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and MSDSs for their exposed workers, and train them to handle the chemicals appropriately.

Reading an  
MSDS  
Exercise

Reading MSDS Power Point

# NFPA Diamond

Please watch the video at the following link

<http://www.slideshare.net/alchemist/nfpa-and-msds-presentation>

# Oil and Gas Well Drilling and Servicing eTool

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General Safety

Site Preparation

Drilling

Well Completion

Servicing

Plug and Abandon Well

[Oil and Gas Well Drilling and Servicing eTool](#) >>



The oil and gas industry employs hundreds of thousands of people and is a vital component of the national economy. Worker safety and health are important to this industry. This eTool\* identifies common hazards and possible solutions to reduce incidents that could lead to injuries or fatalities.

## Explore the Potential Hazards of this Industry



Each drilling and servicing company has its own safety program. This eTool is not a replacement for those programs nor does it establish any industry consensus standards ([industry disclaimer](#)). Rather, it can be used as a resource in identifying workplace hazards and providing possible solutions that may be relevant to their safety programs. This eTool does not purport to identify all hazards and solutions. This eTool focuses on land based operations.

Worker safety awareness is necessary for injury prevention during all phases of drilling and servicing operations. Procedures and processes will include safety meetings, Job Safety Analyses, and general and task-specific training. At the end of each section, resources are identified that provide more details for establishing safe work practices and procedures.



A key element of any effective safety program is the [Job Safety Analysis](#) (JSA). This eTool may be useful in preparing JSAs for your worksite.

### Additional Industry References

There are numerous references to API, AESC, and IADC publications, industry safety handbooks, safety programs, training facilities and programs, under the heading of "Additional Information," which can provide more complete and detailed information.

\*eTools are "stand-alone," interactive, web-based training tools on occupational safety and health topics. As indicated in the [disclaimer](#), eTools do not create new OSHA requirements.

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# Oil and Gas Well Drilling and Servicing eTool

<http://www.osha.gov/SLTC/etools/oilandgas/index.html>

**Review the links on the hexagon for the exam.**

**You may be asked questions on the first page after you click the link**

**Hint – Focus on Potential Hazards & Possible Solutions sections**

# Remember 4 Main Questions To Keep Safe

- **What?**
  - What am I doing?
  - What are other people and equipment doing around me?
- **When?**
  - When can I be in an accident?
  - When can I cause an accident?
  - When will I be safe?
- **Where?**
  - Where am I going?
  - Where can I get hurt?
  - Where is it safe?
- **How?**
  - How can I get hurt?
  - How can I prevent an accident

References:

Occupational Safety & Health website accessed August & November 2010 [www.osha.gov](http://www.osha.gov)

Center for Disease Control and Prevention, National Institute for Occupational Safety and Health, website, accessed November 2010, <http://www.cdc.gov/niosh/>