

Safety Talk

Hot Work Hazards in the Oil and Gas Industry

Before you begin:

- Become familiar with your company's policies on Hot work and permits.
- Research examples and tasks where you use Hot Work Permits in your workplace.
- Review 29 CFR OSHA 1910.252 Hot Work and 29 CFR OSHA 1910.147 Control of Hazardous Energy.
- Review NFPA 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work.



Introduction

Exposing hydrocarbon vapors/liquids to an ignition source can cause a flash fire. A common ignition source in the oil and gas industry is hot work. Employers need to prohibit ignition sources on sites where the vapors/liquids are present or have a solid plan in place to mitigate the risk if hot work operations are necessary. Train employees to recognize the hazards and implement control measures.

Definitions

Hot Work - Work that involves burning, welding, or a similar operation that is capable of initiating fires or explosions. Typical hot work includes welding, grinding, thawing pipe, hot riveting, heat treating, using a torch or any other applications that produce a spark, flame, or heat.

Flash Fire - A short duration fire, usually 3 seconds or less, that spreads by a flame front rapidly through a diffuse fuel, such as vapors of an ignitable liquid, without the production of damaging pressure.

Hazardous (Classified) Locations – Locations where fire or explosion hazards may exist due to flammable gases or vapors.

Discussion

What enforcement agencies in Ohio have codes about performing hot work on oil/gas sites? The Occupational Safety and Health Administration (OSHA) has a standard that applies to all hot work performed in general industry, which includes oil/gas operations. The Ohio Fire Code and the Ohio Department of Natural Resources mention hot work. What do all these codes have in common? They all require the establishment of a safe area, away from fuel sources, for the performance of work.

Fuel sources can take many forms on an oil/gas site. Combustibles, like empty bags or wood pallets, can be found in storage or refuse areas on the pad site. Vapors caused by flammable liquids or flammable gases, such as methane, may be harder to find. How do you know if flammable vapors or gases are present in the area where you want to conduct the hot work? Since most of these vapors are colorless, air monitoring equipment, such as a four-gas monitor is the best method for detection. Conduct monitoring in the low-lying areas surrounding the hot work area, where the vapors may collect and in the immediate area of the hot work. Continuous monitoring may be necessary to alert employees to traveling vapors for other areas on the pad site.

A safer alternative is to conduct the hot work in a designated area. The designated area is outside of the hazardous area (classified location) where flammable vapors are present. For more information on classified locations on an oil/gas site, speak to your supervisor, the Company Man or review API RP 500 Classification of Locations.

What is the name of the program that requires you to isolate an ignition source and secure it in the off position? Lockout/tagout or the control of hazardous energy. The proper application of lockout/tagout can help prevent a flash fire by stopping the release of vapors through piping or processing equipment or shutting down an ignition source such as a pilot light. Common equipment which may need lockout out include gas production units, separators, and combustors.

Complete a hot work permit form before the work begins. The form includes the review of the surrounding area for hazards, controlling those hazards and sign off by supervision or the lease operator. The approval of the Company Man or lease owner is especially important when performing multiple operations simultaneously. A hazard created by one worker can expose multiple others during simultaneous operations. Keep in mind, operator or lease owner may ask you to use their hot work or written work permit system instead of your own.

What type of emergency equipment are you required to keep in close proximity when conducting hot work? At a minimum, supply a 20-pound Type ABC fire extinguisher. If you are involved in Hot Work, you need to be trained on how to correctly use a fire extinguisher. Require a fire watch for a minimum of 30 minutes after the completion of the hot work operation. The purpose of the fire watch is to ensure the area does not begin to smolder or burn. Train the fire watcher in how to initiate a fire alarm and emergency procedures to follow if a fire starts.

What type of clothing should you wear when you perform hot work? Non-melting clothing such as FR or natural fabrics including cotton, wool, and silk. Do not wear synthetic fabrics such as rayon or polyester, since these will melt when exposed to a flame. You can use a NFPA 2112 flash fire rated protective coverall, which will be identified on the label.

Conclusion

Fuel sources are all around us in the oil and gas industry. Our work requires us to use tools that produce ignition sources such as sparks, heat surfaces, and flames. A deadly combination occurs when the right amount of fuel, air, and an ignition source meet. A comprehensive hot work program which includes safe work procedures, a permit system, employee training and personal protective equipment can help us avoid the devastating consequences.

Group Activity

Distribute Hot Work Permits and have participants work in groups to fill out the permits for a few situations that you have pre-determined as relevant to possible daily work practices. For example:

- Hot work on or above combustible floors.
- Combustible materials near by the hot work operation.

To make it challenging, find a few tasks that would be determined as not able to do hot work or where you can substitute another method for hot work. Such as:

- Presence of explosive atmospheres or potentially explosive atmospheres (e.g., on drums previously holding solvents).
- Explosive atmospheres that can develop in areas with an accumulation of combustible dusts (e.g., grain silos).

Resources

[29 CFR OSHA 1910.252 Welding, Cutting and Brazing](#)

[29 CFR OSHA 1910.147 Typical minimal lockout procedures](#)

[NFPA 10 Standard for Portable Fire Extinguishers](#)

[NFPA 51-B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work](#)

[NFPA 2112 Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire](#)