Lewis Energy Group®

STANDARD OPERATING PRACTICE

Hot Work

Lewis Energy Group
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1.0 Purpose & Policy Statement

This Standard Operating Practice (SOP) provides information to ensure the safety of Lewis Energy Group (LEG) Employees and Contractors performing Hot Work at LEG locations and facilities.

LEG Policy Statement

Hot work is any work that involves burning, welding, using fire or spark-producing tools, or that produce a source of ignition. Welding and cutting Operations are common to our industry and can be a hazardous operation due to the inherent danger of fire and explosion and the numerous other operations that can occur simultaneously. Hot work will include pre-job planning that includes a hazard assessment (task specific) and mitigation and control of the hazards present.

2.0 Applicability

This SOP applies to all LEG Team Members conducting Hot Work on LEG locations and facilities whether indoors or outdoors. Contractors acting on behalf of LEG must adhere to this Hot Work Permit SOP. It is the responsibility of the LEG Authorized Company Representative (ACR) to assure that compliance with this SOP is maintained for any Hot Work activity within their area of operation. Each Contractor working on LEG property, facilities or leased property has a responsibility to perform their work activities in a manner consistent with this Hot Work SOP.

3.0 Work Requiring a Written Permit

A Hot Work Permit is required for certain activities that could produce sparks or heat, and is required for any work involving a source of ignition that is conducted under the following conditions and or on these locations:

- Areas within 10 feet that are classified as Class1, Division 1, Class 1, Division II, per the National Electric Code (NEC) National Fire Protection Association (NFPA) 70 requirements.
- Motor vehicles including truck transport that operate within 10 feet of producing wellheads, unless potential hydrocarbon sources such as ventilation valves or open lines are first identified, secured, and confirmed to be properly isolated or to have no pressure.
- Areas where combustible materials are closer than 35 feet from a potential ignition source.
- Areas within 75 feet of a recognized or potential hydrocarbon source.
- On equipment that contains or may contain a flammable or combustible substance or residue such as a compressor, generator, or transfer pump, or on a vessel that contains residue and may release flammable vapors or gases such as a separator or pig launcher.
- On portable or stationary tank(s) such as drums, barrels, chemical tanks and vacuum trucks that are used to haul or store flammable products.
- On lines, piping, or connections such as flow lines, headers or piping associated with a tank battery that may contain flammable mixtures.
- When welding in a confined space.
- Where combustible/flammable material are located on the opposite side of metal partitions, walls, ceilings, or roofs, and are likely to be ignited by heat conduction or radiation.

Some examples of activities that require a Hot Work Permit under the conditions listed in this section includes, but is not limited to:

- Welding
- Cutting
- Brazing
- Burning with a torch, electric arc, or soldering iron
- Using a propane torch (i.e. brush burner)
- Using an open flame
- Grinding
- Power hand tools
- Sand blasting
- Chipping, ripping, or other cutting by impact
- Using internal combustion equipment such as portable generators, and compressors
- Opening energized electrical equipment
- Using explosive-charge powered tools
- Hot tapping
- Using non-explosion-proof equipment such as extension cords

If a Hot Work Permit is required, it must be issued by the LEG ACR. A person designated as the ACR must meet the following qualifications:

- Be aware of the hazards posed by Hot Work
- Receive Hot Work Permit training and complete and maintain competency requirements
- Be familiar with applicable Hot Work requirements for LEG
- Have the required training in instrumentation used during Hot Work activities such as a Combustible Gas Indicator (CGI) and Geiger counter for Naturally Occurring Radioactive Material (NORM)

All applicable LEG and Contract Personnel will communicate with the LEG ACR to determine if a Hot Work Permit is necessary prior to starting work.

4.0 Work Not Requiring a Written Permit

Do not request a Hot Work Permit for the following equipment, or devices (usually considered Hot Work) if the work is done further than 10 ft. from the hydrocarbon source(s) and is outside a hazardous (classified) location:

- Non-intrinsically safe instruments or meters (i.e. cell phones, cameras, laptops, or pagers).
- Permanently mounted auxiliary equipment (e.g., drill rigs, workover rigs, auto cranes, sand-masters, and frac pumps) and specialty trucks/vehicles (e.g., nitrogen transports, wireline units, and well logging) not designed for use in a classified area.

- Truck transports (e.g., water, oil, or tank bottoms) that are properly bonded and/or grounded (exempt unless in the judgment of the driver, the facility supervisor, or conditions would merit a permit.

NOTE: If the activity is within 10 feet of a hydrocarbon-producing source(s), or in a hazardous (classified) location, a written Permit is required. A Hazardous Classified Location is a location where flammable gases or vapors are or may be present in the air, in quantities sufficient to produce explosion or ignitable mixtures per NEC and API recommended practice RP 500.

5.0 Responsibilities

LEG Team Members or Contractors may serve multiple roles listed below if they can successfully perform all duties outlined in this section. For example, a Gas Tester can perform the duty of a Fire Watch with proper training and knowledge of duties for each position.

Gas Tester

A Gas Tester is a LEG Team Member or Contractor who has been trained to operate portable gas testing equipment and is required to conduct the gas testing at the job site. Only personnel trained to operate gas testing instruments will be allowed to conduct the testing. Proof of training and qualifications must be provided to the LEG ACR prior to starting work or issuance of a Hot Work Permit. The results of gas testing will be recorded on the Hot Work Permit at least every two hours. These records will be provided to the ACR at the end of the Hot Work shift.

Fire Watch

A Fire Watch is required for all activities that require a Hot Work Permit. Primary functions of the Fire Watch are:

- To observe conditions in the immediate and adjacent areas to assure that Hot Work is performed safely.
- Immediately extinguish a small fire in its beginning phase should one occur.
- Be trained in the use of portable Fire Extinguishers, the hazards involved with firefighting, and the methods for sounding an alarm in case of fire.
- Maintain a dedicated fire watch for 30 minutes after the Hot Work is completed to detect and extinguish possible smoldering fires.
- As per the Stop Work Authority Policy, have the authority to stop the job if the Fire Watch suspects that conditions have changed or are about to change due to some outside interference.
- Be trained as a Fire Watch.

Fire Extinguishers will be available in all Hot Work areas and will be maintained in a state of readiness. Contractors are required to provide their own Fire Extinguisher(s) that have been inspected and are ready for use. Fire Extinguishers will be visually inspected monthly and on an annual basis by a licensed Fire Extinguisher inspector.

6.0 Job Safety Analysis (JSA)

A JSA will be performed by LEG personnel prior to beginning Hot Work activity.

7.0 Protective Systems

Due to the complexity of Hot Work, protective systems shall be in place to provide a diverse range of protection for affected personnel. These protective systems include:

- Fire Extinguishers, isolation procedures (LO/TO), and personal protective equipment (PPE).
- Emergency exits and muster areas that are clearly communicated to affected personnel including the pathways to exits.
- Emergency evacuation protocol and procedures.
- Fire Watch – refer to Section 5 above.

8.0 Hot Work Permit Form Information

Prior to starting Hot Work, the Hot Work Permit Form must be completed in order to obtain a Hot Work Permit from the ACR. The Hot Work Permit Form is Appendix A to this document.

9.0 Instruments

Instruments purchased for use in the Hot Work program will be pre-approved by the LEG Health Safety and Environmental (HS&E) Department. The HSE Department can be used as a resource to research instrument choices available for Hot Work.

10. Definitions

Authorized Company Representative (ACR) The ACR is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are hazardous to contract employees. The ACR has authorization to take prompt corrective measures to eliminate these hazards. This ACR individual (e.g. safety captain, safety tech, etc.) assures that all required preparations and precautions (isolation, LO/TO, etc.) concerning the work site have been taken and then signs the permit.

Beginning Stage Fire – A fire which is in the initial or beginning stage and can be controlled or extinguished by portable Fire Extinguishers.

Carbon Monoxide – A colorless, odorless toxic gas generated by combustion of common fuels, with an insufficient air supply or where combustion is incomplete.

Combustible Material – A substance that can be ignited and burned.

Combustion – The act or process of continuous burning that follows ignition.

Contractor – A company or person that has the appropriate contract or agreement, to perform services on LEG properties.

Explosion – A rapid increase of pressure followed by a sudden release.

Fire Extinguisher – A device used to extinguish flame. An extinguisher may contain either liquid or dry chemicals or gases, and is tested and rated to indicate its ability to handle specific classes of fire.

Fire Classifications – The three types of common classifications that apply to Hot Work:

(1) Class A (ordinary combustibles such as paper, wood, textiles); (2) Class B (flammable liquids or gases-gasoline, paint, methane) (3) Class C Energized electrical equipment.

Fire Triangle - The Fire Triangle or Combustion Triangle illustrating the three elements a fire needs to ignite: heat, fuel, and an oxidizing agent (usually oxygen).

Fire Watch – At least one individual dedicated solely to looking out for the occurrence of fires.

Flammable – Any substance that is easily ignited, burns quickly and intensely, or has a rapid rate of flame spread.

Flash Point – The lowest temperature of a liquid at which it gives off sufficient vapor to form an ignitable mixture with the air near the surface of the liquid or within the storage vessel.

Gas Tester - A competent person trained to operate portable gas testing equipment.

Hazardous Classified Location – a location where flammable gases or vapors are or may be present in the air, in quantities sufficient to produce explosion or ignitable mixtures per NEC and API recommended practice RP 500.

Hot Tap – A technique used to attach connections to pipe, vessels, or tanks that are in service. The process involves welding on equipment and piping under pressure, and cutting through an open valve with a tapping bar.

Hot Work – A hazardous activity which uses equipment or tools that have the potential to create or introduce an arc, spark, open flame, or any other ignition source that presents a fire risk. Some examples include sand blasting, grinding, and opening energized electrical junction boxes.

Hot Work Permit - The means by which the HSE department tracks activities that involve Hot Work. The Hot Work Permit provides a step-by-step check list for Hot Work fire safety and serves as a reminder to contractors and Team Members of their fire prevention responsibilities before, during, and after any Hot Work is conducted.

Job Safety Analysis (JSA) - is a method that can be used to identify, analyze and record: 1) the steps involved in performing a specific job, 2) the existing or potential safety and health hazards associated with each step, and 3) the recommended action(s)/procedure(s) that will eliminate or reduce these hazards.

Lower Explosive Limits *(LEL) – The lower limit of flammability of a gas or vapor at ordinary ambient temperatures expressed in percent of the gas or vapor in air by volume.

Example: the flammable range of methane is 5 % by volume in air. Any reading below 5 % would be too lean to burn and any reading above 15% is too rich to burn.

Lockout/Tagout (LO/TO) – A means to assure isolation of all energy sources.

National Electric Code (NEC) NFPA 70 - A regionally adoptable standard for the safe installation of electrical wiring and equipment in the United States. It is part of the National Fire Codes series published by the National Fire Protection Association (NFPA), a private trade association. Despite the use of the term "national", it is not a federal law. It is typically adopted by states and municipalities in an effort to standardize their enforcement of safe electrical practices.

NEC Class 1, Division 1 - Ignitable concentration of flammable gases or vapors that exist under normal operating conditions, frequently because of repair operations, maintenance operations, leakage, and are released through breakdown or faulty operation of equipment or processes in which the breakdown causes electrical equipment to become a source of ignition.

NEC Class 1, Division 2 - Ignitable concentration of flammable gases or vapors normally confined within closed containers when handled, processed, used, or are normally prevented by positive mechanical ventilation or are located adjacent to a Class I, Division 1 locations.

NFPA – National Fire Protection Association.

Stop Work Authority - the authority that all LEG Team Members are given when they believe a situation exists placing them, their co-worker(s), contracted personnel, or the public, at risk or in danger, and/or if a Team Member is not comfortable that he/she has enough information to safely execute a procedure or process.

Upper Explosive Limit *(UEL) – The maximum proportion of vapor or gas in air, above which ignition of flame does not occur.

11. Document Control Process

The records associated with this SOP will be maintained for a minimum of five years.

Version	Change Date	Change Description	Changed by	Approved by	Approval Date
1.0	8/20/19	• Change Procedure to Practice • Add Policy Statement • Change Business Objective to Purpose & Policy Statement • Change LEG personnel to LEG Team Members • Remove PSM Verbiage • Add Hot Work Form • Capitalize Team Member	Colin Clark	Ken Phillips	8/20/19
1.1	10/17/19	• Update Cover Page • Clean up Formatting	Colin Clark	Ken Phillips	10/17/19
1.2	5/29/24	Review Only	Colin Clark	Ken Phillips	5/29/24

NOTE: Changes to this document shall be reviewed by the Sub-Committee and approved by the Executive Safety Committee (ESC). Any document revisions are to be noted on the Document Review Change Log. This form shall be kept current to maintain audit compliance.

Appendix

HOT WORK FORM

Hot Work Form

Lewis Energy Group

Company Name:					
Permit Start: Date: Time:			Permit Completion: Date: Time:		
Work Area:					
Specific Equipment To Be Worked On:					
Work Description/Purpose:					
Note: A new permit must be obtained at the beginning of each new shift.					

SPECIAL PRECAUTIONS

1. Pre-job safety meeting (JSA) held with all affected personnel?	[ ]
2. Have all combustible and flammable materials within 35 feet of hot work area, been relocated or protected?	[ ]
3. Is the atmosphere acceptable for performing hot work? Ventilated [ ] Cleaned [ ] Purged [ ] Inert [ ]	[ ]
4. Has the affected equipment been isolated? Disconnected [ ] Blind plated [ ] Double block and bleed [ ] Blind Flange [ ]	[ ]
5. Have all energy sources been identified and isolated? Electrical [ ] Pneumatic [ ] Hydraulic	[ ]
6. Have all ignition sources been identified (cathodic protection, iron sulfide, etc.)?	[ ]
7. When welding around non-combustible walls have combustibles been relocated or a fire watch stationed on both sides?	[ ]
8. Has an inspection been completed with person performing the hot work to identify potential fire /explosion hazards?	[ ]
9. Has Fire Watch been trained in assigned duties?	[ ]
10. Have all floor openings/cracks where sparks could ignite material below been protected?	[ ]

ATMOSPHERIC TESTING

Instrument:			Serial#:				Calibration Date:				
Authorized Gas Tester:			Frequency: [ ] Initial [ ] Continuous [ ] periodic								
Test	Reading	Time									
O_2	19.5% - 23.5%										
LEL	>10%										
H_2S	10 PPM										
CO	35 PPM										
Instrument:			Serial#:				Calibration Date:				
Authorized Tester:			Frequency: [ ] Initial [ ] Continuous [ ] periodic								
Test	Reading	Time									
NORM	50 µRems (AB)										

PERSONAL PROTECTION

Grounding/Bonding	[ ]	SDS Review	[ ]	Non-Sparking Tools	[ ]
Fire Extinguisher	[ ]	Fall Protection	[ ]	Emergency Rescue	[ ]
Lockout/tagout	[ ]	Classified Electrical Area	[ ]	Emergency Exits	[ ]

AUTHORIZATION SIGNATURES

Requesting Representative:	Permit Cancellation:
Fire Watch:	
Authorized Company Representative:	