



Hot Work CoW Technical Standard

Version	Date	Approver
1.0	March 31, 2024	JO EHS

Introduction

Hot Work requirements are designed to help prevent injuries to personnel, damage to property, or adverse environmental impact from fire or explosion when performing hot work. Hot work is the planned process or work that has a significant potential to start fires or cause an explosion due to the production of flames, heat and/or sparks in the presence of flammable or combustible materials/vapors.

Hot tapping is a type of hot work activity considered high-risk that requires subject matter expert input, written procedures, and high-level management approval.

Requirements

The following sections provide minimum requirements for hot work and support guidance to clarify their intent.

- Requirements of this Standard shall be met.
- Guidance in this Standard may be used as an aid to develop local documents that meet or exceed Control of Work (CoW) requirements. If examples are provided within the guidance sections, they are not meant to represent the only acceptable means for meeting a requirement. WJO may develop or use other suitable methods not discussed in this document if the requirements are met. Implementation of this guidance is not auditable.

1.	Requirement:	A Hazard Analysis shall be conducted in accordance with the Hazard Analysis CoW Standard when planning work involving Hot Work.
2.	Requirement:	Equipment shall be isolated in accordance with the Isolation of Hazardous Energy CoW Standard before conducting Hot Work.
3.	Requirement:	Gas testing shall be conducted in accordance with the Portable Gas Detection CoW Standard.
4.	Requirement:	Permit Required Work Authorization shall be required for Open Flame Hot Work in Hazardous (Classified) areas.
	Guidance:	API RP 500 should be consulted as a resource to define Hazardous (Classified) areas / common equipment in areas or situations that are not addressed in WJO Standards or local legal definitions.
5.	Requirement:	WJO shall assess associated hazards to determine when a Hot Work Permit is required for:
		<ul style="list-style-type: none"> a. Open Flame Hot Work outside a Hazardous (Classified) area b. Non-Open Flame Hot Work inside a Hazardous (Classified) area
	Guidance:	See Appendix A for Open Flame Hot Work and Non-Open Flame Hot Work definitions. See Appendix B for examples of Hot Work Classifications.

		Devices utilized to cook or prepare food do not require a hot work permit if the area is designed and safe for such tasks.
6.	Requirement:	Hot Work shall be authorized in accordance with the Work Authorization CoW Standard.
7.	Requirement:	A Hot Work Permit shall not be required for Open Flame Hot Work inside a designated Safe Hot Work Area (See Appendix A for Definition).
8.	Requirement:	<p>Designated Safe Hot Work Areas shall be approved by WJO management (Division Superintendent or Team Leader) and include the following conditions:</p> <ul style="list-style-type: none"> a. Located outside of a Hazardous (Classified) Area b. Clearly identified and communicated c. Made of non-combustible or fire-resistant construction or adequately guarded or protected d. Maintained free of flammable and combustible materials or such materials shall be adequately guarded or protected e. Reassessed at least annually or when conditions change to maintain these required conditions
	Guidance:	<p>Welding and/or Metal fabrication shops are identified as Designated Safe Hot Work Areas if they meet the requirements described.</p> <p>Buildings designed for use inside Hazardous (Classified) areas may be Designated Safe Hot Work areas with proper safeguards in place (i.e., pressurization, gas detection, flame suppression systems) with approval by Contract Superintendent / Group Manager.</p> <p>Designated safe hot work area shall be reassessed when conditions change OR every one year with approval by the Division Superintendent/ Team Leader or contract owner. Records of the most recent assessment shall be kept with the division and associated contractor at safe welding sites.</p>
9.	Requirement:	<p>Hot Work in a Hazardous (Classified) Area shall only be performed when the following conditions are met:</p> <ul style="list-style-type: none"> a. The Lower Explosive Limit (LEL) is 0%-10%. 0% LEL is preferred; however, Hot Work can continue above 0% and below 10% if the source of the flammable vapor is identified and controls are in place for work to proceed safely. or b. LEL is >10% and <20%, the source of the flammable vapor is identified, and controls are in place designed to maintain the LEL below 20%. Work with LEL in this range shall be approved by a group manager. Work shall not be performed when LEL is above 20%.
	Guidance:	It should be communicated when Hot work is being performed adjacent to Classified areas.

<p>10. Requirement:</p> <p>Guidance:</p>	<p>The following work site preparations are required for Open-Flame Hot Work inside of a Hazardous (Classified) area or in a non-classified area when combustible materials have not been removed up to 35 feet (10.7 meters), including but not limited to:</p> <ul style="list-style-type: none"> a. A designated fire watch, equipped with fire-fighting equipment, shall remain onsite to inspect the work area verifying it is free of fires or smoldering materials for the duration of the work and for at least 30 minutes after Hot Work is complete. b. Fire-fighting equipment shall be functional and inspected within the required inspection frequency, and inspections shall be documented (i.e., physical/digital equipment inspection tags). c. Combustible materials shall be removed or protected within the hot work area. d. Heat, slag, or sparks that the work may generate shall be contained within the hot work area. e. Drains within the hot work area shall be sealed or covered with non-combustible materials. f. Vents, drains, or open-ended piping inside of the hot work-controlled area that have the potential to introduce a flammable atmosphere shall be routed away from the hot work area or isolated per the Isolation of Hazardous Energy CoW Standard. This includes disconnecting, blinding, or capping piping and tubing from tanks (or other equipment) before performing Hot Work. g. Purging, flushing, and/or draining to atmosphere shall be stopped. h. Openings and air gaps into equipment, tanks, or piping that have the potential to introduce a flammable atmosphere within the hot work-controlled area shall be sealed, covered, or protected. <ul style="list-style-type: none"> i. Floor openings, holes, ducts, or cracks in floors or walls, open doorways and open or broken windows that cannot be closed or removed and may be exposed to sparks shall be protected within a 35-foot (10.7 meter) radius. i. Flammable and combustible materials adjacent to the opposite side of partitions, walls, ceilings, bulkheads, or roofs that are likely to be ignited by conduction, radiation, or direct flame contact shall be protected. <p>More than one fire watch may be required if the hot work activity cannot be observed along with the area potentially exposed to sparks (e.g., elevated locations, adjacent areas divided by walls, etc.).</p> <p>See Appendix D for matrix regarding hot work site requirements.</p>
<p>11. Requirement:</p>	<p>Open Flame Hot work on any tank, vessel, or piping containing flammable contents while still in service shall require approval by Division Superintendent or Team Leader.</p>

	Guidance:	When feasible, avoid Hot Work on equipment that is still in service and schedule Hot Work to avoid concurrent activities (SIMOPs).
12.	Requirement:	Personnel conducting activities associated with Hot Work shall meet the training and competency requirements that apply to their roles, in accordance with Training and competency CoW standard.
13.	Requirement:	Documentation associated with Hot Work shall adhere to the record retention requirements detailed in the Control of Work SHEERS Process.

APPENDIX A: Terms and definitions

Term	Definition
Designated Safe Hot Work Area	A designated area that is outside the classified area and clear of combustible, ignitable and flammable materials at a minimum distance of 35 feet (10.7 meters).
Explosive Atmosphere	A mixture of flammable gases, vapors, liquids, or dusts with air capable of being ignited by an open flame, electric arc or spark, or device operating at or above the ignition temperature of the gas-air mixture.
Gas Testing	<p>Use of portable detection equipment by the Qualified Gas Tester, including detector tubes and combustible gas indicators, to determine levels of oxygen and flammable or toxic vapors and gases.</p> <p>A process whereby the required gas tests are continuously or intermittently monitored. Continuous or intermittent gas testing is normally required when there is a likelihood of changing gas concentrations and/or there is a high risk to workers if the gas concentration changes unexpectedly.</p> <p>See Portable Gas Detection OE Standard</p>
Hazardous (Classified) Area	A location where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers.
High-Level Approver	<p>A person with the competency and authority to make a risk-based evaluation and determine whether proposed deviations from a CoW requirement and alternate controls adequately reduce risk and allow safe execution of work.</p> <p>WJO will designate the group manager as a high-level approver for deviations from a CoW requirement.</p>
Hot Tapping	A procedure used in repair, maintenance and service activities that involves welding on and then cutting an opening into a piece of equipment (pipelines, vessels, or tanks) that is under pressure or in service, for the purpose of installing connections or appurtenances. A special procedure is required to weld a connection onto a pipe, vessel or tank that is in service without leaking any of the contents or causing an explosion or fire.
Hot Work	A process or work task that has a significant potential to start fires or cause an explosion.
Hot Work Area	An area that is within a 35-foot (10.7 meter) radius around where the Hot Work is taking place.
Intrinsically Safe Equipment	Intrinsically safe equipment as "equipment and wiring which is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration."

Term	Definition
Non-Open Flame Hot Work	A process or work task that is capable of producing sparks or heat (low energy) that could be a potential source of ignition.
Lower Explosive Limit (LEL)	Lowest concentration (percentage (%)) of a gas or vapor in air capable of producing a flash of fire in the presence of an ignition source (arc, flame, heat). Also called lower flammable limit (LFL).
Open Flame Hot Work	A process or work task with visible flame or spark production (high energy) capable of igniting combustible materials resulting in a fire or explosion.

Appendix B: Hot Work Classification

Open Flame Hot Work: Open flame, visible spark producing, high energy
Air Arcing – Arc gouging
Burning acetylene or other gases (e.g., gas cutting, torch cutting)
Welding, brazing, and all associated activities including burning and grinding
Any activity or process where the equipment has elements that are heated at or above the auto-ignition temperature of process medium and/or immediately adjacent combustible materials (e.g., extrusion welding, vulcanization, soldering)
Non-Open Flame Hot Work: Non-open flame, spark potential, low energy
Abrasive Blasting
Electric power tools
Hand-held battery-operated tools (excluding those deemed intrinsically safe by a recognized third-party certification laboratory)
Pneumatic power tools
Hot tapping – cutting an opening into equipment that is in service
Hydro-blasting, hydro-vac and vacuum truck operations, and other tasks that produce static accumulated charges
Electric, diesel or gasoline powered motorized vehicles and equipment (e.g., trucks, man-lifts, scissor lifts, forklifts, light towers, generators)

Appendix C: Roles and responsibilities

Role	Definition	Responsibilities
Fire Watch	<p>An individual trained and competent in basic firefighting whose primary role is to observe conditions in the immediate and adjacent areas of hot work to ensure it is performed safely and to sound the alarm if needed.</p> <p>Fire Watch can have multiple roles so long as the individual can fulfill the primary responsibilities listed.</p>	<ul style="list-style-type: none"> • Inspect worksites prior to hot work activities being conducted to verify that all combustible materials are either removed or protected. • Ensure that openings within the hot work area are covered and/or sealed appropriately. • Observe hot work activities and ensure sparks are contained and monitor for ignitions. • Observe conditions in the immediate and adjacent areas of Hot Work to ensure it is performed safely and sound the alarm if necessary. • Extinguish any incipient fire if it is safe to do so. • Raise alarms in events of fire. • Maintain watch at the area for at least 30 minutes after completion of hot work and inspect adjacent areas where sparks or flames may have traveled for signs of combustion. • Observe conditions in the immediate and adjacent areas of hot work to ensure that the work is performed safely and that any requisite conditions on the permits to work are complied with. • Understand when to stop work.

Appendix D: Hot Work Site Requirements

	Permit Required	Fire Watch	Gas Testing
Open Flame in Hazardous (Classified) Area	Yes	Yes	Yes
Non-Open Flame in Hazardous (Classified) Area ¹	Yes ²	No	Yes
Open Flame in Non-Classified Area	Division Discretion	Yes ³	No
Non-Open Flame in Non-Classified Area	No	No	No
Non-Intrinsically Safe Equipment/Device in Classified Area ¹	Division Discretion ²	No	Yes
Designated Safe Hot Work Area	No	No	No

¹. Battery Operated Watches (Non-smart watch), keyless car entry devices, hand-held calculators, and hearing aids are exempted devices (no permit required) due to low-risk ignition source.

². Cell phones and cameras can be exempted from this requirement in Class 1 Div 2 area by the division.

³. Unless combustibles are removed >35 feet from Hot Work area.

Appendix E: References

Internal References

CES ELC-EN-300-2018 Hazardous (Classified) Areas
WJO Control of Work SHEERS Process
WJO Hazard Analysis CoW Standard
WJO Work Authorization CoW Standard
WJO Isolation of Hazardous Energy CoW Standard
WJO Portable Gas Detection CoW Standard
WJO Marine Terminals Onshore Standard

External References

American Petroleum Institute (API)

Recommended Practice 500 Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
Recommended Practice 2009 Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries

American National Standards Institute (ANSI)

ANSI/ASSE Z49.1 Safety in Welding, Cutting, and Allied Processes

California Occupational Safety and Health Administration (Cal-OSHA)

Title 8, Chapter 4, Subchapter 15 Petroleum Safety Orders -- Refining, Transportation and Handling

International Association of Oil and Gas Producers (IOGP)

Report No. 459 Life-Saving Rules

International Safety Guide for Oil Tankers and Terminals (ISGOTT)

National Fire Protection Association (NFPA)

NFPA 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

Occupational Safety & Health Administration (OSHA)

OSHA 1910.252 Welding, Cutting, Brazing