

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 1 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

Contents

1.0 Introduction 2	8.1 Designated Hot Work locations/buildings shall:..... 9
1.1 Purpose..... 2	8.2 Temporary Fabrication Areas shall: 10
1.2 Scope..... 2	
1.3 Retroactivity Error! Bookmark not defined.	
1.4 Record Retention 2	9.0 Fire Suppression Equipment 10
2.0 References 3	9.1 Requirements 10
2.1 Refining Standards 3	10.0 Internal Combustible Engines (ICES) As An Ignition Source..... 10
2.2 Industry Codes and Standards..... 3	10.1 The following are types of motor vehicles considered ICE 10
2.3 Government Regulations 3	
3.0 Terms and Definitions 4	11.0 Temporary Portable Pump 11
4.0 Roles and Responsibilities 5	11.1 If a site PMOC/MOC is used, it must contain, at a minimum, the following: 11
5.0 Hot Work Requirments 6	12.0 Ventilation 11
5.1 General Process Equipment Preparation..... 6	12.1 Natural Ventilation 11
5.2 Welding Cutting Equipment Requirement 6	12.2 Local Exhaust Ventilation 11
5.3 Hot Work on Used Containers and Out of Service Equipment:..... 7	13.0 Bolted Process Work For Hot Work 12
5.4 Special Precautions While Hot Work is in Progress: 7	13.1 Key concerns during the Bolt Up process: Error! Bookmark not defined.
6.0 Atmospheric Monitoring for Hot Work 7	14.0 Welding PPE..... 12
6.1 Apply the following requirements for atmospheric monitoring for hot work: 7	14.1 Welding and cutting operations will require additional Personal Protective Equipment (PPE). 12
6.2 Initial Atmospheric Monitoring: 7	15.0 Shields, Guards And Curtains For Containing Heat and Sparks 13
6.3 Mid-Shift Atmospheric Monitoring (for Attended Hot work only) 8	15.1 Sparking Hot Work Activities 13
6.4 Continuous Atmospheric Monitoring: 8	16.0 Special Hot Work Requirments For Aboveground Storage Tanks (ASTS) 13
7.0 Atmospheric Monitoring for Confined Space:..... 8	16.1 AST Floor Hazard Assessment..... 14
7.1 The following additional requirements/consideration shall apply for hot work in Confined Spaces: 8	16.2 AST Shell Hazard Assessment: 14
8.0 Designated Hot Work Shops & Fabrication Areas..... 9	16.3 AST Roof Structure Hazard Assessment: 14
	16.4 AST Floating Roof Hazard Assessment: 14
	17.0 Revision History..... 16

List of Tables

Table 1	Definitions Error! Bookmark not defined.
Table 2	Sample Table Title (Table Caption) Error! Bookmark not defined.

Hot Work	Document No.: HSS-630	Approval Date:	Page 2 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Safety Standing Instruction (HSS) is to provide minimum requirements to ensure that Attended Hot Work and Non-Attended Hot Work is performed safely within the refinery to prevent injury, loss of life, and loss of property from fire or explosion

1.2 Scope

This HSS for Hot Work Authorization represents a composite of petroleum industry safe practices and the OSHA requirements for this type of task.

Because Hot Work can encompass so many different situations and applications this HSS does not attempt to address every possible situation. If a special need or problem is encountered during Hot Work activities, consultation between Maintenance and the Safety Department should be conducted before proceeding. Any alternative procedures must be at least as effective as the requirements in this HSS.

Note: Hot-taps and in-service welding require specialized procedures and additional review and authorization. Please refer to FS 540 Welding on Equipment in Service, SAF-046-In service Welding and Hot Tap, MTN-PIPE-024-T-101B-Hot Tap Drilling Machine prior to performing these activities.

1.3 Records Retention

Printed copies of this document should not be retained more than 12 months. Any revision to this document will be retained indefinitely.

2.0 REFERENCES

All applicable requirements from LAR Standards shall be considered an integral part of this Program. Applicable Standards as well as resources utilized, are listed below. Short titles will be used herein when appropriate.

2.1 Refining Standards

Number	Description
PSA 13-08	E/M Refinery Exchanger Fire
PSA 16-02	Galveston Bay Refinery Fire at Temporary Pump Installation
RRD-1323-000	Safe Equipment Preparation Guidelines
RSP-1127-000	Confined Space Entry
HSS-201	Safe Work Permit
HSS-306	Respiratory Protection Program
RSP-1715-000	Hot Work
RSP-1715-000-FORM01	Elevated LEL Hot Work Approval Form
RSP-1715-000-FORM02	PMOC Form for Temporary Portable Pumps

2.2 Industry Codes and Standards

Number	Description
<i>American Petroleum Institute (API)</i>	
API RP 2009	Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries
API RP 2201	Safe Hot Tapping Practices in the Petroleum & Petrochemical Industries
API RP 2207	Preparing Tank Bottoms for Hot Work
NFPA 51B	Standards for Fire Prevention during Welding, Cutting, and Other Hot Work; 2014 Edition

2.3 Government Regulations

Number	Description
29 CFR 1910.252	General Requirements for Welding, Cutting, and Brazing
29 CFR 1926 Subpart J	Welding and Cutting
Title 8 CCR §1537	Welding, Cutting, and Heating of Coated Metals.
Title 8 CCR §4851	Arc Welding and Cutting
Title 8, CCR, §6777.	Hot Work Procedures and Permits

Hot WorkDocument No.: **HSS-630**

Approval Date: 09/16/2020

Revision No.: **000**

Next Revision Date: 09/16/2023

Document Custodian: **Safety Department****Page
4 of 24****3.0 TERMS AND DEFINITIONS**

The following additional terms and definitions are applicable to this Standard.

- 3.1.1 [Attended Hot Work](#)
- 3.1.2 [Battery Powered Equipment](#)
- 3.1.3 [Class A Combustible Material](#)
- 3.1.4 [Cold Work](#)
- 3.1.5 [Hazardous Atmosphere](#)
- 3.1.6 [Hot Tapping \(Pressure Tapping\)](#)
- 3.1.7 [Hot Work](#)
- 3.1.8 [In-Service Welding](#)
- 3.1.9 [Joint Job Site Visit](#)
- 3.1.10 [Non-Attended Hot Work](#)
- 3.1.11 [Owning Department](#)
- 3.1.12 [Oxygen Deficient Atmosphere](#)
- 3.1.13 [Safe Work Permit](#)
- 3.1.14 [Servicing Representative](#)

Reference: For details, see [Appendix A: Terms and Definitions](#).

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 5 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

4.0 ROLES AND RESPONSIBILITIES

4.0.1 The table below describes the roles and responsibilities related to this document

Roles	Responsibilities
Fire Watch	<p>The following are minimum requirements for the fire watch, when required:</p> <ul style="list-style-type: none"> (a) The fire watch must be trained to understand the inherent hazards of the work site and hot work, and the hot work permit. (b) Ensure the conditions of the Safe Work Permit are met before hot work and maintained during hot work. (c) The fire watch shall print their legal name (i.e. the name listed on your badge) on the space provided on the reverse side of the Safe Work Permit. (d) Have the authority to stop work and do so if unsafe conditions develop. Stop all activities when an emergency siren is activated, when a deviation from provisions set forth in the Safe Work Permit is observed, or when changing conditions are observed that would adversely affect employees and/or equipment. (e) Have fire extinguishing equipment readily available and be trained in use of that equipment including extinguishing small fires. (f) Discuss assembly/evacuation areas and escape routes for work crew (e.g. welders, pipefitter, etc.) and other affected personnel and ensure that fire extinguishing equipment (e.g. fire extinguisher and charged fire hose) will cover their escape. (g) Know how to sound an alarm (air horn) and/or contact emergency personnel in the event of a fire or changing conditions. (h) Ensure sewers within 35 feet of the Attended Hot Work area are covered and spark containment is adequate. (i) Remain at the site of Hot Work for at least 30 minutes after Hot Work is complete when there is a potential for smoldering fires (e.g., Class A combustible materials within 35 feet of the Hot Work area.) (j) All Fire Watches shall wear an FR-rated high-visibility orange or red vest while performing Fire Watch duties.
Permit Writer	<p>The Owning Department employee who prepares and issues the Hot Work Permit shall:</p> <ul style="list-style-type: none"> (a) Be responsible as a representative of the owning department for safe operation of hot work activities. (b) Inspects the work site and prepares the hot work permit and presents it to the servicing department. (c) Conduct a Joint Job Site Visit (JJSV) with the employee(s) or contractors who will perform the work. If contractors are involved, the permit writer shall discuss the hazards with the contractor representative or elect to discuss with contract employees directly. (d) Determines if a fire watch is required. (e) Determines the site-specific flammable materials, hazardous processes, and other potential fire hazards that are present or likely to be present at the hot work location. Ensure these hazards are mitigated prior to issuing a Safe Work Permit. (f) Conduct atmospheric monitoring per Section 6.0 of this HSS (g) Determines and documents any fire extinguishing equipment requirements on the Safe Work Permit.
Servicing Group	<ul style="list-style-type: none"> (a) Comply with all conditions specified on the Safe Work Permit. (b) STOP Hot Work activities if conditions of the Safe Work Permit can no longer be met. (c) Ensure tools and equipment to be used are in good-working condition and are safe to use. (d) Verify atmospheric monitoring has been completed. (e) Ensure gasoline or diesel powered equipment is shutdown in the event of an emergency/evacuation.

5.0 HOT WORK REQUIREMENTS

5.1 General Process Equipment Preparation

- 5.1.1 If possible, equipment and piping that will be involved in any Hot Work must be:
- Isolated and/or disconnected,
 - Cleaned, gas free, and tested, and
 - Vented to prevent over-pressurization
- 5.1.2 If the equipment and piping cannot be cleaned and gas freed, cold cutting methods must be used for initial cuts so adequate atmospheric monitoring can be conducted to ensure the equipment/piping is gas free.
- 5.1.3 Welding on utility lines (e.g., steam, condensate, etc.) under pressure shall require all precautionary measures taken for similar work on oil and gas lines (e.g., in-service welds).
- 5.1.4 Demister pads in vessels shall be removed prior to hot work if they pose a hazard due to the work activity being performed.
- 5.1.5 Structured packing shall be removed prior to Hot Work if it poses a hazard from Hot Work activity (or precautions must be put in place to mitigate sparks or slag from contacting the packing).
- 5.1.6 Refer to RRD-1323-000 for piping and equipment preparation recommendations

5.2 Welding Cutting Equipment Requirement

- 5.2.1 All welding and burning equipment (e.g., leads, grounds, hoses, cables, gauges, regulators, etc.) shall be visually inspected daily, and prior to hot work occurring, to ensure the equipment is in good working condition.
- 5.2.2 Every effort shall be made to locate weld machines outside of process and dike areas. Weld machines must also be positioned such that exhaust will not negatively impact the atmosphere of employee working areas and confined space entries.
- 5.2.3 Welding grounds shall be grounded as close to the work as possible. When welding on pumps, turbines, or compressors, to eliminate welding machine grounding through bearings or seals, the ground lead shall be adjacent to the work.
- 5.2.4 Effort must be made to route leads and hoses overhead and/or out of walkways to prevent creating tripping hazards.

5.3 Hot Work on Used Containers and Out of Service Equipment:

- 5.3.1 Hot Work shall not be performed on used drums, barrels, tanks, or other containers until they have been thoroughly cleaned to make sure there is no flammable materials present or any substances such as greases, tars, acids, or other materials that when subjected to heat, might produce flammable or toxic vapors. Any pipelines or connections to the drum or vessel shall be disconnected or blinded

5.4 Special Precautions While Hot Work is in Progress:

- 5.4.1 When performing Hot Work activities, the Servicing Group and Owning Department Representative shall take the following into consideration:
- Wind direction,
 - Potential upstream hazards when performing Hot Work adjacent to drainage basins, separators, and open ditches,
 - Other work activities in the adjacent area, and
 - Sewers, drains, manholes, oily water sumps, equipment, combustibles, personnel, etc. below, when performing Hot Work from an elevated location

6.0 ATMOSPHERIC MONITORING FOR HOT WORK**6.1 Apply the following requirements for atmospheric monitoring for hot work:**

- 6.1.1 Atmospheric monitoring must be conducted in the immediate work area per the Safe Work Permit Safety Standing Instruction and the results of the monitoring shall be recorded in the appropriate section of the Safe Work Permit.
- 6.1.2 As a minimum, the atmospheric monitors must use a calibrated/bump tested combustible gas indicator to determine oxygen and flammable vapor concentrations before hot work is started.

Note: Ensure there is adequate atmospheric oxygen inside the monitoring area, per the manufacturer's recommendation, for correct operation of the combustible gas indicator.

6.2 Initial Atmospheric Monitoring:

- a. Atmospheric monitoring must not be completed until after all blinding, disconnecting, purging, steaming and other preparatory work has been completed, and in as short a time as possible before hot work is started. In every instance atmospheric monitoring must be conducted within two hours prior to the start of work.

Hot Work	Document No.: HSS-630	Approval Date:	Page 8 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

- b. When work is not started within two hours of the time the atmospheric monitoring was conducted, new, additional atmospheric monitoring must be conducted and documented on the Safe Work Permit.

Hot Work Atmospheric Monitoring Limits	
Oxygen	19.5% - 23.5%
LEL	0%

Note: This Procedure may allow Hot Work in atmospheres up to 10% LEL where the source of the flammable vapors is known. Approval for work in these atmospheres must be approved using the Elevated LEL Hot Work Approval Form (Appendix B) and must include a plan that addresses the following items:

- Justification to complete the Hot Work at increased LEL.
- Additional control procedures required to complete the Hot Work safely.
- Conditions when the Hot Work must be stopped.

6.3 Mid-Shift Atmospheric Monitoring

- 6.3.1 Additional tests must be made at least midway through the maintenance shift (i.e. shifts that are greater than 4 hours) after the initial Safe Work Permit has been issued and more frequently if there is any doubt that conditions might have changed.
- 6.3.2 Additional atmospheric monitoring must be conducted after a change in conditions or upon request of the servicing group.

6.4 Continuous Atmospheric Monitoring:

- 6.4.1 The Owning Department Representative will require continuous atmospheric monitoring for any attended Hot Work activity.

Note: Mid-shift atmospheric monitoring is still required when continuous atmospheric monitoring is conducted

7.0 ATMOSPHERIC MONITORING FOR CONFINED SPACE:

7.1 The Confined Space RSP shall be followed and in addition the following additional requirements/consideration shall apply for hot work:

- 7.1.1 Provisions shall be made to ensure adequate ventilation for each person conducting Hot Work in the confined space. Cutting or welding operations must be performed such that an additional hazard to personnel is not created.

Hot Work	Document No.: HSS-630	Approval Date:	Page 9 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

- 7.1.2 Fumes can be created by cutting or welding on surfaces which are galvanized, contain chromium, or lead contaminated and may require additional respiratory protection or other control measure to limit personnel exposure. Refer to HSS 306 Respiratory Protection Program.
- 7.1.3 An increase in oxygen and/or flammable gases could occur from leaking cutting torch or hoses.
- 7.1.4 When welding is suspended and the space is vacated for more than 15 minutes (e.g., lunch, breaks, shift change, etc.) all electrodes are to be removed from their holders and the machine turned off and/or disconnected from its power source.
- 7.1.5 For gas welding /burning in confined spaces torches and hoses must be removed from the confined space and/or disconnected at the fuel gas and oxygen cylinders, when work is stopped, and the space is vacated for more than 15 minutes.
- 7.1.6 Compressed gas cylinders shall never be staged, stored, or located inside a confined space.
- 7.1.7 Mechanical ventilation shall be required when welding occurs inside of confined spaces. Certain large and/or open-air confined spaces (e.g., heaters, open tanks, excavations, etc.) may be exempt from this requirement provided there is adequate natural ventilation.
- 7.1.8 Plant air shall not be used as a source of ventilation if plant air is backed by Nitrogen

8.0 DESIGNATED HOT WORK SHOPS & FABRICATION AREAS

8.0.1 LAR can designate permanent locations designed or approved for Hot Work operations.

8.1 Designated Hot Work locations/buildings shall:

- 8.1.1 Be naturally and/or mechanically ventilated to prevent an accumulation of toxics,
- 8.1.2 Not allow the presence of combustible materials within 35 feet of the welding/cutting area,
- 8.1.3 Store any flammable liquids present in an approved flammable liquids storage cabinet,
- 8.1.4 Be equipped with appropriate fire extinguishing equipment, and
- 8.1.5 Have appropriately marked exits

Note:

- ✓ Additional atmospheric monitoring may be required (up to continuous monitoring) if the fabrication area has the potential to build-up toxic or flammable gases and/or fumes.
- ✓ The site Industrial Hygienist shall be notified of the construction of new Hot Work locations/buildings in order to determine if ventilation is appropriate for the intended use.

Important: Any fabrication area within 35 feet of process equipment shall require a Fire Watch when performing work covered by the definition of Attended Hot Work per this Safety Standing Instruction.

8.2 Temporary Fabrication Areas shall:

- 8.2.1 Be naturally and/ or mechanically ventilated to prevent an accumulation of toxics,
- 8.2.2 Not allow the presence of combustible materials,
- 8.2.3 Not allow the storage of flammable liquids, and
- 8.2.4 Have two means of egress available from the fabrication area.

Important: Fabrication areas established outside of the battery limits and away from other process hazards including live process piping (e.g., laydown yard, remote fabrications area, etc.) may not require a Safe Work Permit based on a hazard assessment conducted by The Safety Department.

9.0 FIRE SUPPRESSION EQUIPMENT

9.1 Requirements

- 9.1.1 Fire suppression equipment is required at all Attended Hot Work sites ready to be used in the event of an incipient fire.
- 9.1.2 The following is the minimum acceptable fire suppression equipment to be maintained at the site of the Hot Work activity:
 - 20lb. dry chemical fire extinguisher
 - Charged water hose
- 9.1.3 The Owning Department Representative can require additional fire protection based on the surrounding conditions and other fire risks. This additional fire protection may include:
 - 150lb. dry chemical fire extinguisher,
 - Multiple charged fire hoses,
 - Multiple fire extinguishers, and
 - On-site ERT

10.0 INTERNAL COMBUSTIBLE ENGINES (ICES) AS AN IGNITION SOURCE

10.1 The following are types of motor vehicles considered ICE

- 10.1.1 A motor vehicle or other equipment (e.g., light plants, compressors, welding machines, etc.) are considered potential ignition sources.

Important Note: Refer to HSS-201 for details on how ICE's and these ignition sources will be controlled in the Safe Work Permit process under Atmospheric Monitoring.

11.0 TEMPORARY PORTABLE PUMP

- 11.0.1 The use of portable pumps to pump hydrocarbons must be managed to control potential ignition sources, releases, and fires.
- 11.0.2 The Proceduralized Management of Change (PMOC) (see Appendix C) must be completed in KMS/Intelix prior to the start-up of any non-intrinsically safe portable pump used to pump hydrocarbons inside tank dikes or unit battery limits.

11.1 If a site PMOC/MOC is used, it must contain, at a minimum, the following:

- 11.1.1 PMOC/MOC duration,
- 11.1.2 Product and pump specifications,
- 11.1.3 Hazard review,
- 11.1.4 Approvals,
- 11.1.5 Implementation actions, and
- 11.1.6 Pre-startup safety review (PSSR).

Note: Temporary non-intrinsically safe pumps used to pump hydrocarbons that are located inside tank dikes or unit battery limits must be manned at all times while in operation and equipped with a remote shutdown device (e.g., lanyard, electronic shutoff, disconnect switch, fuel shutoff valve, etc.).

Reference: Refer to MPC Process Safety Advisory, [PSA 16-02](#), which covers an event that resulted in a fire while utilizing a portable pump to transfer hydrocarbons from a tank

12.0 VENTILATION

12.1 Natural Ventilation

- 12.1.1 Adequate natural or mechanical ventilation shall be considered to reduce or eliminate the hazards of weld fumes. Any accumulation of gases must be vented to a safe location, away from the Hot Work.

12.2 Local Exhaust Ventilation

- 12.2.1 Local exhaust ventilation is required for any welding or torch work conducted inside enclosed structures. Contact the site Industrial Hygienist to determine adequacy of the ventilation configuration

13.0 BOLTED PROCESS EQUIPMENT AND HOT WORK

- 13.1.1 Spark producing Hot Work (e.g., torch cutting, grinder with a cut-off wheel, reciprocating saw) is sometimes required to remove bolts/studs on bolted connections of process equipment. In order to prevent the ignition of flammable or combustible vapors and liquids inside process equipment, the seal on the gasket of the process equipment must be maintained.
- 13.1.2 To ensure that the seal on the gasket is maintained during hot work removal of studs/nuts, at least four bolts must always be able to be removed via mechanical means (e.g., impact wrench, hand tools) for the final break on process equipment connections.
- 13.1.3 Four bolt flanges require a new bolt be replaced as each bolt is cut

Note: On larger pieces of equipment with multiple bolts/studs more than four bolts may be required to maintain the gasket seal. The new bolts must be spaced adequately to maintain the gasket seal during Hot Work removal of the remaining bolts. Contact Engineering when unsure about the required gasket stress.

Refer to MPC Process Safety Advisory; [PSA 13-08](#), on an industry event that resulted in fatalities while hot cutting bolts of a heat exchanger

14.0 WELDING PPE

14.1 Welding and cutting operations will require additional Personal Protective Equipment (PPE).

- 14.1.1 These additional PPE requirements must be identified on the Safe Work Permit. Examples of these additional PPE requirements include:
- Respiratory protection for toxic metal fumes,
 - Correct shade of eye protection for welding and cutting operations (e.g., welding hoods, cutting goggles, etc.),

Note: Welding hoods cannot be used for grinding unless they are approved for grinding operations.

- Welding gloves,
- Face shield,
- Welding leathers, and
- Fall protection equipment.

Hot WorkDocument No.: **HSS-630**

Approval Date: 09/16/2020

Revision No.: **000**

Next Revision Date: 09/16/2023

Document Custodian: **Safety Department****Page
13 of 24****15.0 SHIELDS, GUARDS AND CURTAINS FOR CONTAINING HEAT AND SPARKS****15.1 Sparking Hot Work Activities**

15.1.1 Stray sparks from Hot Work activities create a major fire risk in a refinery. Every effort must be made to contain sparks as best as practicable to prevent fires from Hot Work.

15.1.2 The following minimum requirements must be implemented:

- Remove or cover any combustible material within 35 feet of the Hot Work.
- Seal all sewers, drains and manholes within 35 feet of the Hot Work site to prevent emission of flammable vapors from the sewers, drains and manholes and conduct appropriate atmospheric monitoring to verify.
- Construct spark containments of fire blankets and/or fire-resistant tarps to prevent sparks and slag from impacting live process equipment or other areas where flammable vapors or liquids could accumulate.
- Prevent or mitigate emissions of flammable vapors from tank vents, pit vents, oily water sumps, and seal/packing vents on pumps/compressors within 35 feet of Hot Work and conduct the appropriate atmospheric monitoring to verify.

Note: Welding and cutting shall not be performed if fire hazards cannot be moved and guards cannot be used to protect immovable fire hazards

16.0 SPECIAL HOT WORK REQUIRMENTS FOR ABOVEGROUND STORAGE TANKS (ASTS)

16.0.1 Because of the unique hazards of conducting Hot Work on ASTs the following additional requirements must be taken into consideration on top of the normal Hot Work items identified on the Safe Work Permit. This section applies to out-of-service ASTs undergoing maintenance and turnaround activities. The safety plan for AST work must, at a minimum, address the following, where applicable.

16.1 AST Floor Hazard Assessment

- 16.1.1 Hydrocarbons of other previously stored flammable materials may be present under AST floors which need repair. This is more probable if there has been a breach in the floor. Prior to cutting the floor with an open flame, the Servicing Group shall take appropriate precautions to ensure that flammables are not present under the AST floor. Refer to [API RP 2207](#).
- 16.1.2 The AST must be checked for the presence of a double bottom or sketch plates welded to the perimeter of the AST. Where this condition exists, refer to the precautions outlined in [API RP 2207](#).
- 16.1.3 The floor area must be inspected to ensure that patch plates were not used to cover old water draw or process sumps. Where these areas are suspected, holes should be drilled in the floor to verify there is no product under the patch plate.

16.2 AST Shell Hazard Assessment:

- 16.2.1 AST shell surface must be inspected for the presence of product residue, wax, ignitable rust or scale in the areas where hot work may be performed.
- 16.2.2 Historically, equipment in contact with amines, hydrogen fluoride or “sour” (hydrogen sulfide containing) materials has been susceptible to hydrogen blistering. This occurs more often in areas which have been welded. If the AST contained one of these products or if hydrogen blistering is suspected for any other reason, an evaluation by a qualified person (e.g., metallurgist) must be included in the determination of whether it is safe to perform hot work

16.3 AST Roof Structure Hazard Assessment:

- 16.3.1 Verify that product residue is not present on the upper surfaces of the roof rafter.
- 16.3.2 Some ASTs were constructed using piping as structural support columns. Where this is the case, verify that mouse holes were cut at the base of the columns so they can be free draining

16.4 AST Floating Roof Hazard Assessment:

- 16.4.1 Deck
- The underside of the floating roof must be inspected for the presence of product residue, wax, ignitable rust or scale in the areas where hot work could be performed.
 - The floating roof must be inspected to verify there are no pockets of hydrocarbon that could be trapped between the decks plates due to the underside of the floating roof being seal welded.

16.4.2 Seals:

- If the AST is equipped with either a primary or secondary resilient urethane foam log, it must be removed or protected from hot sparks prior to hot work being performed in the area. These seals can leak and trap hydrocarbon.
- Mechanical shoe-type seals need to be inspected for liquids and must be cleaned prior to hot work being performed in the area. The area between the top side of the primary fabric and the bottom side of the secondary seal fabric or underside of wiper must be clean. Outer rim plates, shoe seals, springs and other seal hardware must be clean and vapor free prior to any hot work activity

16.4.3 Pontoon & Double Decks:

- All deck and pontoon covers must be opened and each compartment free of hydrocarbon, ignitable rust, scale or wax, prior to any Attended Hot Work on or near the float roof.

16.4.4 Floating Roof Deck Penetrations

- All leg sleeves, vacuum breaker sleeves, gauge wells, column and ladder wells must be inspected for cleanliness and verified that they are hydrocarbon free.
- Floating roof and vacuum breaker legs can hold product. Prior to hot work, each leg must be cleaned and free draining.
- Gauge poles must be inspected to verify that they are free draining and clear of wax, product residue and scale.

16.4.5 AST Nozzle and Piping Hazard Assessment:

- Verify that jet and internal distributors are clean and both vapor and liquid free.
- Foam lines must be checked for hydrocarbons. The frangible diaphragms often break allowing for product vapor to leak from the ASTs.
- Skimmer and drain piping must be drained, cleaned and gas free prior to performing hot work.

16.4.6 Hazard Assessment for Areas Adjacent to ASTs

- Tank dike must be free of combustible materials that could be affected by the Hot Work.
- Process valve bonnets and flanges located in the tank dike must be checked for leakage.
- All drain and vent valves located in the tank dike must be inspected to ensure there is a plug installed.
- The ground around the AST must be inspected to check for the possibility of an underground line leak.

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 16 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

17.0 REVISION HISTORY

17.0.1 The revision history of the Standing Instruction is included below:

Revision Number	Description of Change	Custodian	Approved By	Approval Date
0	Integrated HSS for MPC LAR Hot Work Safety	Rinaldo Edmonson	Mike Kulakowski	09/16/2020

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 17 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

Appendix A Terms and Definitions

Term	Description
Attended Hot Work	Attended Hot Work is hot work that requires a fire watch. Some examples of attended hot work are: burning, welding, brazing, electric arc welding, annealing (electric or gas), electric soldering, stress relieving, use of open flames, use of non-process propane or gas fired heaters, cutting and grinding, CAD welding, and if combustible materials are within 35 feet of worksite. This type of hot work requires the placement of covers on sewers, drains and manholes covers within 35 feet. These listings are not all-inclusive.
Battery-Powered Equipment	Use of unclassified, Battery-Powered Equipment (e.g., cordless drills, computers, cell phones) requires a hot work permit. Personal devices (e.g., hearing aids, watches, and other medical devices) with button batteries are exempt from the Hot Work permit requirements.
Class A Combustible Materials	Class A Combustible Materials are ordinary combustibles such as wood, cloth, or paper
Cold Work	Cold Work is maintenance, repair, cleaning, or construction activity, not requiring the use of fire, hot surfaces, spark producing equipment, or electrical equipment that is not classified for use in the area
Hazardous Atmosphere	A Hazardous Atmosphere is an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a permit space), injury, or acute illness
Hot Tapping (Pressure Tapping)	Hot Tapping (Pressure Tapping) is the practice of installing a valve connection and then drilling or cutting into the pipe or equipment, through the valve connection, while the pipe or equipment is in service or has not been purged (hydrocarbon gas free).
Hot Work	Hot Work is repair, maintenance, or construction activity, which requires the use of spark- producing equipment or may create an ignition source. Note: LAR has designated that all areas with the exception of the MPC Maintenance Shops Building will require hot work permits and a designated fire watch for attended hot work.
In-Service Welding	In-Service Welding is the practice of welding on pipe or equipment (for example, tank, vessels, exchangers, etc.) which is in-service. This includes grinding, burning, and welding for any purpose, such as adding brackets, shoes, boxing in leaks, adding weld-o-lets and back welding fittings. Reference: For detailed permit requirements for in-service welds, see the site specific In- Service Welding and Hot Tapping Procedure listed in the reference section of this document.
Joint Job Site Visit	Joint Job Site Visit is a meeting between an Owning Department representative and at least one servicing representative of all parties working off of the permit at the specific location where the job will be conducted. The meeting discussion will address the work scope and all safety aspects of the permit. The servicing representative that attends the Joint Job Site Visit must convey the information covered in the discussion to all members of their work party.

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date:	Page 18 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

Term	Description
Non-Attended Hot Work	Non-Attended Hot Work is hot work that does not require a fire watch. Some examples of non-attended hot work are: concrete breaking; use of unclassified hand tools, lights, and extension cords, non-explosion proof cordless tools, non-intrinsically safe flash cameras, gasoline or diesel-powered equipment (e.g., compressors, generators, pressure washers, etc.), opening of energized explosion proof enclosures, abrasive blasting, and grass cutting in dike area
Owning Department	Owning Department refers to the department that owns and operates process, process-related, and/or utility equipment, machinery, building, and/or systems
Oxygen Deficient Atmosphere	Oxygen Deficient Atmosphere is any atmosphere containing less than 19.5% oxygen by volume
Safe Work Permit	<p>The Safe Work Permit is a work-authorizing process and record that is managed, prepared and issued by the Refining department that “owns” the equipment or is responsible for the area before certain work is conducted.</p> <p>Notes:</p> <p>(1) It authorizes a specific scope of work for a specific time frame and is a prerequisite for performing work.</p> <p>(2) It is used to assess hazards and to document requirements and conditions such as atmospheric monitoring results, personal protective equipment, confined space details, work requirements (e.g., hot tap, excavation, critical lift), emergency communications, and other potential hazard mitigation means and methods.</p> <p>(3) The authorization coordinates and controls the work and is a form of agreement between the Safe Work Permit issuer and all personnel involved with the work.</p>
Servicing Representative(s)	Servicing Representative(s) are the people who are working on the equipment/process. This may include operations, blending shipping, maintenance, contractors, and salaried employees.

Hot Work

Document No.: **HSS-630**

Approval Date:

Revision No.: **000**

Next Revision Date:

Document Custodian: **Safety Department**

Appendix B Elevated Hot Work Form

Elevated LEL Hot Work Approval Form (RSP-1715-000-FORM1)	
Company Performing Work:	_____
Date: _____	Time: _____ Area/Unit: _____ Permit No.: _____
Hot Work to be Completed:	_____
Describe the Source of the Flammable Vapors:	_____ _____ _____ _____
Justification to Complete the Hot Work at Increased LEL:	_____ _____ _____ _____
Additional Control Procedures Required to Complete the Hot Work Safely:	_____ _____ _____ _____
Conditions When the Hot Work Must be Stopped:	_____ _____ _____ _____
_____	_____
Maintenance Manager	Safety Supervisor

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 20 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

Appendix C PMOC Form for Temporary Portable Pumps

PMOC Form for Temporary Portable Pumps (RSP-1715-000-FORM2)			
Initiation and Initial Review	Initiator _____ Date _____ Responsible Person _____ Target Completion Date _____ Area / Unit _____ Title _____ Description of Change _____ _____ Technical Basis for Change _____ _____ Pump Dead Head _____ Pipe MAWP _____ @ _____ °F Flow rate _____ Hose MAWP _____ @ _____ °F Process stream _____ Specific Hazards _____ Expiration date for this temporary change (max expiration 6 months): _____ Approver (Change Approver/Area Team Lead - sign) _____		
	Categories of Change (check all that apply). Type: <input type="checkbox"/> Trailer/vehicle mounted <input type="checkbox"/> Skid mounted <input type="checkbox"/> Stand alone Driver: <input type="checkbox"/> Diesel <input type="checkbox"/> Gasoline <input type="checkbox"/> Electric <input type="checkbox"/> Air <input type="checkbox"/> Steam <input type="checkbox"/> Hydraulic driven		
Hazard Review	Hazard Review Checklist	Yes	No
	1. Have you confirmed that this change meets the acceptable use of the PMOC? If no, comments (required): _____		
	2. If the Portable Pump is a diesel/gasoline engine driven, have you confirmed that an (intrinsically safe) electric, air, steam, or hydraulically driven pump use is infeasible? If no, comments (required): _____		
	3. Has the portable pump and hose design been approved by Engineering to meet MPC design requirements for the service it is being used for? If no, comments (required): _____		
	4. Is the portable pump intrinsically safe? (If you answer "no" when in operation it must be 100% manned.) If no, comments (required): _____		
	5. Can connections be made primarily with hard piping? (If no, have steps been taken to minimize run of hose?) If no, comments (required): _____		

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date: 09/16/2020	Page 21 of 24
	Revision No.: 000	Next Revision Date: 09/16/2023	
	Document Custodian: Safety Department		

Hazard Review Checklist		Yes	No	N/A
Hazard Review, continued	6. Have you considered/addressed the consequence of hose failure? <i>(Process Safety, Environmental, Industrial hygiene).</i>			
	If no, comments (required): _____			
	7. Have you considered/addressed personnel hazards caused by the installation of the pump or piping?			
	If no, comments (required): _____			
	8. Have you considered/addressed the effects of reverse flow? <i>(Is a check valve needed)?</i>			
	If no, comments (required): _____			
	9. Is the Portable Pump/Hoses compatible with the process fluid? (Consider corrosion, erosion, and/or contaminants in the process?)			
	If no, comments (required): _____			
	10. Is the Portable Pump/Hoses rated for the entire range of the process pressure (Consider normal maximum and minimum, blocked in case and thermal expansion)?			
	If no, comments (required): _____			
	11. Is the Portable Pump/Hoses rated for the entire range of the process temperature (maximum and minimum)? (Start-Up, Shutdowns, Steam Out, N2 purge, etc)			
	If no, comments (required): _____			
	12. Is the downstream piping and equipment rated for the portable pump max dead head? <i>(Pressure and Temperature)</i>			
	If no, comments (required): _____			
13. Have you reviewed the impacts on upstream and downstream units or the piping header? <i>(Pressuring up the header and backing out upstream/downstream units/equipment).</i>				
If no, comments (required): _____				
14. Have any inspection requirements identified for the temporary pump hose/piping installation been included in the Safety Plan?				
If no, comments (required): _____				

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date:	Page 22 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

Hazard Review Team	The Portable Pump Hazard Review has been completed and the change is acceptable (Print/sign) _____ Date _____ Shift Foreman or Process Specialist or Day Foreman <i>(one is required)</i>	
	(Print/sign) _____ Date _____ Operations Hourly Representative <i>(required)</i>	
	(Print/sign) _____ Date _____ Area Team Reliability Engineer <i>(required)</i>	
	(Print/sign) _____ Date _____ Safety Professional or Safety Supervisor <i>(one is required)</i>	
	(Print/sign) _____ Date _____ Environmental Area Team Rep <i>(required)</i>	
	(Print/sign) _____ Date _____ Other <i>(if necessary)</i>	
Approval to Implement Change	The Change Approver/Area Team Lead has reviewed and authorized the proposed change. Name (print/sign) _____ Date _____	
Implementation Actions		Completed By / Date
	1. Ensure that the Portable pump installation has been permitted with a Safe Work Permit. <i>(Foreman)</i>	
	2. Ensure that a plot plan overview showing the exact pump location with distances marked to nearby hydrocarbon service equipment and any other hazards in the area has been documented. (This plan should be stored in the supervisor's office and a copy attached to the PMOC. <i>(Foreman)</i>)	
	3. Ensure that a detailed and documented Safety Plan has been completed. Safety Plan shall include the purpose of the pump, the justification for use of the pump, the frequency of monitoring of the pump, provisions for monitoring per hazard Review, how any risks arising from the use of the pump will be managed, and documentation from the manufacturer (the horsepower for the engine and the engine manufacturer's specification sheet detailing NOx and CO emissions factors (in lb/hp-hr)) to support use for the service they are being placed in. (This should be stored in the supervisor's office and a copy attached to the PMOC. <i>(Foreman)</i>)	
	4. Ensure that Stationary and Portable Engine Authorization, Monitoring and Record Keeping Requirements have been followed <i>(Foreman)</i>	
	5. Provide Operations with a "Red-Lined" copy of the affected PSI (P&IDs, etc) to reflect the change. <i>(Area Team Reliability Engineer)</i>	
	6. Construction and equipment has been field verified to be in accordance with the design specifications (i.e., metallurgy flange ratings, spec breaks, bolting, torquing, expansion loops, vents and drains, support, fill materials, etc.) <i>(Area Team Reliability Engineer)</i>	
	7. Confirm that the valves have been orientated such that their position, open or closed, is readily apparent. <i>(Foreman)</i>	

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date:	Page 23 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

Implementation Actions, continued		Completed By / Date
	8. Confirm that the check/non-return valves have been mounted in the horizontal position? <i>Note: A vertical location can adversely affect the response of some types of check/non-return valves and should be avoided. For vertical upward flows, there are certain types of check/non-return valves more suited to the duty, such as vertical/globe/angle lift check valve and tilting-disk check valve? (Foreman)</i>	
	9. Confirm that manual valves, that could potentially be needed to respond to an emergency situation, are readily accessible? <i>(Foreman)</i>	
	10. Confirm that a form of secondary containment system has been installed with the pump and/or fuel tank. <i>(Foreman)</i>	
	11. Ensure that a safety work order has been created to repair the permanent pump. <i>(Foreman)</i>	
	12. Ensure that the Environmental Evaluator has been informed of the date when the Portable pump arrived onsite and when the engine is expected to start operation. <i>(Foreman)</i>	
	13. Ensure that Environmental has authorized the emissions from the engine prior to startup and LDAR has been informed of operation. <i>Note: LDAR must monitor the portable pump and associated fugitive components during operation but no later than 30 days after the portable pump is placed into operation. (Environmental Area Team Rep)</i>	
14. Ensure the rented equipment is entered into the rental equipment tracking system.		
Pre-Startup Safety Review		Completed By/ Date
	1. Confirm that the change was made in accordance with intended design and design specifications, including all local requirements. <i>(Area Team Reliability Engineer)</i>	
	2. Confirm that any affected procedures have been updated and if so, that they are in place and adequate <i>(Process Specialist)</i>	
	3. Confirm any pre-startup actions identified from Evaluation are completed. <i>(Responsible Person)</i>	
	4. Confirm affected operating personnel have been informed of the Change. <i>This item is considered confirmed when the communication and the date of entry are put in OpsCore (Foreman)</i>	
	5. Confirm affected Maintenance personnel have been informed of the Change. <i>(Maintenance Foreman)</i>	
6. Confirm that Process safety Information (PSI) affected by the change and required for startup is current and accurate, and readily available. <i>(Area Team Reliability Engineer)</i>		
Approval to Startup	(Signature) _____ Date _____ <p align="center">Owning Department Manager <i>(or designee)</i></p>	
	(Signature) _____ Date _____ <p align="center">Change Approver/Area Team Lead</p>	

Marathon Los Angeles Refinery – Health & Safety Standards

Hot Work	Document No.: HSS-630	Approval Date:	Page 24 of 24
	Revision No.: 000	Next Revision Date:	
	Document Custodian: Safety Department		

Post Startup Action Items	Send completed PMOC to Process Safety to be entered into KMS as Post-Startup Action Items	Assigned to / Due Date / N/A
	1. Ensure that Pride has been updated for this change. <i>(The portable pump and hoses should be inspected as a Pride activity.)</i>	
	2. Notify Environmental of the removal of diesel pump to document that the diesel pump was not used for more than 6 months <i>(Responsible Person)</i>	Due 6 months from pump delivery
	3. Maintain MSS emissions (not required for electric or pneumatic drivers). <i>(Environmental Area Team Rep)</i>	

REVISION HISTORY

Revision No	Revision Details	Revised By	Approved By	Revision Date	Effective Date
0					