1. About this Protocol

Purpose	This protocol was established to ensure Devon implements safe work practices to protect individuals while performing or working near hot work activities.
Objective	This protocol establishes minimum safe work practices for personnel exposed to hot work hazards, and hot work operations.
Scope	This Devon Energy EHS Protocol defines what is required to protect workers during hot work operations, defines area classification, and lists special concerns for hot work activities.
Applicability	Devon employees who visit or work at field facilities. Devon employees who perform or oversee hot work activities. Contractors will have their own program that meets or exceeds Devon's Hot Work Protocol.
Variances	None.
Superseded Documents	None.

2. TABLE OF CONTENTS

3. ROLES

Division/Business Unit Leadership	Reinforce adherence to this protocol and provide resources for application of the protocol. Ensure employees responsible for hot work duties receive required training.
Line Supervisor	Understand how this protocol applies to personnel in their area of responsibility. Ensure employees have training, skills, knowledge and understanding to comply with this protocol. Check periodically to ensure the requirements of this protocol are being met.
Environmental, Health, and Safety	Provide technical resources and tools for protocol application. Monitor compliance through the audit process.
Devon Employees	Adhere to the requirements of this protocol. Identify and report gaps in this protocol. Complete required training.
Contract Company Representative	Comply with regulatory requirements and follow the Devon EHS protocols.

4. PROTOCOL PREREQUISITES

4.1 PROTOCOL OVERVIEW

The Hot Work Permit Protocol provides regulatory criteria for Devon employees and contracts. This protocol includes information on potentially hazardous areas, hot work area preparation, and permit issuance. All questions about the Hot Work Permit Protocol can be directed to an EHS team member at the appropriate location.

4.2 APPLICABLE STANDARDS

OSHA 29 CFR 1926 Subpart J, Welding and Cutting
OSHA 29 CFR 1910 Subpart Q, Welding, Cutting, and Brazing

5. PROTOCOL

5.1 POTENTIALLY HAZARDOUS AREAS

Step	Required Action	
5.1.1	Designate areas listed below as potentially hazardous areas, which will require the completion of a hot work permit before beginning hot work activities: • Areas within 75 feet of aboveground hydrocarbon/flammable containing equipment • Areas within 75 feet of underground hydrocarbon containing equipment that has been uncovered • Areas within 35 feet of combustible materials, excluding greenfield construction areas provided precautions are implemented to prevent inadvertent fires when hot work is performed within 35 feet of combustible materials **Note:** Initial authorization and precautions will be documented on a job hazard analysis, work permit, or an equivalent document. • Areas within 35 feet of vehicles that transport hydrocarbons/produced water (e.g., vacuum trucks) **Note**: This refers to other hot work activities taking place in the area of these vehicles, not the activities of the vehicle itself. • Areas under burn ban conditions **Note:** All areas shall be checked prior to starting hot work activities to determine if work area is a potentially hazardous area.	Line Supervisor

5.2 HOT WORK HAZARD ASSESSMENT

Step	Required Action	
5.2.1	Determine if the work to be conducted is considered “hot work”. Hot work examples include, but are not limited to the following: • Welding (e.g., arc, cad, mig, tig, arch gouge, oxy/act, etc.) • Chipping • Cutting/burning • Flaming (e.g., freeing seized bearings, etc.) • Grinding • Hot tapping of lines or vessels	Employee/Contract Company Representative

- Soldering/brazing
- Using spark producing equipment
- Using vehicles and moving equipment inside a tank's secondary containment or firewall
- Sandblasters, hot oilers, or other spark producing operations
- Manually lighting production equipment
- Opening energized electrical equipment in an electrically classified area

Note: See step 5.2.3 for exception requirements.

5.2.2	Request a hot work permit, if one of the hot work activities, listed above, is being performed in the following location: • Potentially hazardous area (Step 5.1.1) • On partitions, walls, floors, or ceilings of any building • On equipment that contains or may contain a flammable or combustible substance or its residue	Employee/Contract Company Representative
5.2.3	Designate activities listed below as hot work if within 10 feet of above ground production equipment containing hydrocarbons or within an electrically classified area. A hot work permit is not required for these activities when initial and continuous LEL monitoring is conducted prior to and during the task, with results less than 10% and monitoring equipment has been calibrated in accordance with the manufactures recommendations. • Use of internal combustion engines (e.g., vehicles, weed eater, generators, mowers, etc.) • Use of non-explosion proof electrical equipment (e.g., heaters, coils, power tools, extension cords, motors, lights, etc.) • Use of battery powered devices (e.g., cellular telephones, computers, test equipment, diagnostic tools, pagers, flashlights, etc.) which are not intrinsically safe. **Note**: If the production equipment is housed inside a non-pierced, vapor-tight enclosure, the task will be considered hot work only when located within the electrically classified area. **Note**: Vehicles in transit on established roads are exempt. If a vehicle is parked and left running, equipment is open, or there is a leak initial and continuous LEL monitoring will be required.	Employee/Contract Company Representative
5.2.4	Develop a Standard Operating Procedure for manually lighting fired	Business Unit

production equipment and hot oil operations. At a minimum include the requirements listed below: Fired Vessel: • Steps to isolate the fuel gas valves for the pilot and the main burner. • Purging process that lists adequate time for the equipment to purge in accordance with the manufacture's instructions. • Initial and continuous LEL monitoring to verify the atmosphere outside the equipment does not exceed an LEL of 10%. • Stop the lighting operations if the LEL exceeds 10% outside of the equipment. • Wear additional PPE to include a Nomex hood and leather or FR gloves. • Verifying the fuel gas regulator is set per manufactures operating instructions. • Inserting the "torch" inside the fire box, fire tube, or fire chamber before opening the gas valve to the burner. • Lighting the pilot light first. • Standing to the side of the burner when inserting the torch into the fire box. • Training individuals lighting fired equipment on the manufactures' lighting instructions. • The torch is long enough to reach the burner without needing to put any part of the hand, arm or body inside the equipment. Hot Oil Operations: • Properly address low wind speeds and wind direction. • Initial and continuous LEL monitoring. • Position hot oil truck up wind. • Minimum 50 vent hose piped downwind (if truck is equipped with vent line). • Bonding cable to equipment being serviced. • Wind sock or streamer to visibly monitor wind direction. • Red zone established around pressurized equipment. • Properly rated restraints or whip checks are installed to hard piping/hose connections. • Properly rated hose or piping for service.	Leadership / Field EHS

5.3 HOT WORK AREA PREPARATION

Step	Required Action	Role

5.3.1	Comply with the Energy Isolation Protocol, and equipment specific isolation procedures related to equipment associated with hot work operations.	Employee/Contract Company Representative
5.3.2	Prior to starting hot work activities, verify equipment previously considered hydrocarbon free (e.g., greenfield construction areas) does not contain flammables. If flammables are discovered, this will be designated a potentially hazardous area which will require a hot work permit and permit requirements (see step 5.1.1).	Employee / Contract Company Representative
5.3.3	Move all combustible and/or flammable materials that can be moved, out of the hot work area. If it is not possible to move the combustible and/or flammable materials, the following precautions should be taken: • Using fire-resistant covers • Using tight covers on all open containers, replacing if necessary • Rendering contents inert **Note**: Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition. Wherever there are floor openings, or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.[2] **Note**: If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided. **Note**: Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be performed if the work is close enough to cause ignition by conduction.	Employee/Contract Company Representative
5.3.4	Isolate all drains and sumps that could contain hydrocarbons/ flammables. Pump out all open sumps, and securely cover to prevent sparks and slag from entering the sumps.	Employee/Contract Company Representative

5.3.5	Consider alternate methods to hot work and use whenever possible in burn ban conditions. If hot work is unavoidable in burn ban conditions additional precautions shall be taken upon approval.	Permit Issuer
5.3.6	Follow local, state, or regional regulations during burn ban conditions when work being performed involves welding, grinding, or an open flame. **Note**: Manually lighting fired production equipment is exempt from burn ban condition requirements identified in this section.	Permit Issuer
5.3.7	Request approval for hot work from the individual listed in the table below under burn ban conditions. Implement controls listed in Step 5.3.7 when local, state, or regional regulations do not exist.	Permit Issuer

Sustained Wind Speed	Approval Level	Perimeter (See Step 5.3.7)
0-20 mph	Superintendent	35 feet
21-30 mph	Operations Manager	35 + Spark Enclosure
31+ mph	VP	35 + Spark Enclosure

5.3.8	Establish a perimeter clear of vegetation, and other combustibles using the distances established in Step 5.3.6. **Note**: If unable to clear the perimeter of vegetation for the appropriate distance, the vegetation should be soaked with water.	Employee/Contract Company Representative

5.4 PERMIT ISSUANCE

Step	Required Action	Role
5.4.1	Assign duties of writing a hot work permit to individuals who have completed the hot work training, and validation listed in section 8.	Line Supervisor
5.4.2	Provide on the permit a clear description or sketch of the equipment, work area, and work to be performed. **Note**: These documents may be attached to the permit.	Permit Issuer
5.4.3	Conduct a pre-work inspection of the work site for potential fire and other hazards. • All combustible and/or flammable materials that can be moved must be moved out of the hot work area.	Permit Issuer, Permit Receiver and Fire Watch

	• Eliminate or mitigate other identified potential hazards to reduce risks. • Verify the sprinkler system inside the building(s) is not impaired when welding inside a building(s) with a sprinkler system.	
5.4.4	Check all hazardous energy sources for isolation before hot work begins. When issuing a hot work permit inside a confined space, such as a tower, vessel, tank, manhole, furnace firebox, etc., isolation can be achieved through one of the following methods: • Blinding, • Physical disconnecting lines to vessel, or • Double block and bleed.	Permit Issuer
5.4.5	Notify other personnel in the area that hot work operations are to be conducted.	Permit Issuer
5.4.6	Verify all equipment used in hot work operations is in proper working condition, and grounded prior to beginning hot work.	Permit Issuer
5.4.7	Verify all drains and sumps that may contain hydrocarbons have been isolated, as per the Energy Isolation Protocol.	Permit Issuer
5.4.8	Verify the meter has been calibrated within the manufacturer's recommended calibration frequency. Record the monitor serial number and manufacture on the hot work permit.	Permit Issuer
5.4.9	Perform and record the following atmospheric tests in the following order: • oxygen content, • flammable vapor concentrations (LEL), and • any potentially toxic material concentrations in the hot work area (e.g., H2S, CO) **Note**: Atmospheric testing is not required when the only potential hazard is a combustible material.	Permit Issuer
5.4.10	Check the surrounding area and equipment, tanks, piping, containers, low points, sumps, drains, and areas between the equipment.	Permit Issuer
5.4.11	Stop the hot work permitting process and determine cause if the test results do not meet the criteria listed below:	Permit Issuer

Oxygen	19.5 to 23.5% atmospheric concentrations for employee work areas. **Note**: When inerting piping or process equipment, concentration must be below 14% inside the piping or equipment. However atmospheric concentrations outside in employee work areas must remain between 19.5 to 23.5%.
LEL	10% or less. **Note**: Any reading between 1 and 10% LEL must be fully investigated to identify and understand the source and determine if a hot work permit should be issued.
H_2S	10 ppm or less.
Toxic Level	Above the Permissible Exposure Limit (PEL) or Occupational Exposure Limit (OEL). **Note**: For PEL, see the SDS.

5.4.12	Designate a trained individual to continuously monitor the atmosphere during the hot work operation, and record monitoring results after each break on the hot work permit.	Permit Issuer
5.4.13	Stop the work on location and cancel the permit if the LEL increases to 10%, the oxygen level moves outside the required range, or a toxic level exceeds the exposure limit during the hot work operations, the following steps must be taken.	Permit Issuer/Line Supervisor
5.4.14	Investigate and determine the source of the high reading. Isolate the source of the increased concentration.	Permit Issuer
5.4.15	Start the hot work permit process at the beginning and issue a new hot work permit.	Permit Issuer
5.4.16	When working in an area where NORM has been detected or suspected, sample for NORM and implement controls following the EHS NORM Implementation Plan.	Permit Issuer
5.4.17	Assign a fire watch who will monitor for accidental fires during welding, cutting, grinding, and/or open flame activities. **Note**: Assigned fire watch(s) will have no other responsibilities.	Permit Issuer

5.4.18 Stop hot work activities if any of the following occur: — Fire Watch

- Sparks, flames, or heat is projected outside the permitted area, or
- Any other hazard/unsafe condition develops or is detected that endangers personnel or equipment.

5.4.19 Post a fire watch for at least 30 minutes after the actual hot work has ceased or completed to ensure hot slag does not cause hot spots or fires. — Permit Issuer

5.4.20 Select and specify on the permit the number, size, and type of fire extinguisher(s) required to properly protect workers performing hot work. — Permit Issuer

Class	Service
A	Ordinary combustible materials including wood, cloth, paper, rubber, and many plastics
B	Flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases
C	Fires that involve energized electrical equipment

Note: The quantity of fire extinguishers will be based on the size and complexity of the hot work operation. For example, multiple hot work activities on multiple levels may require more than one fire extinguisher

5.4.21 Maintain fire extinguishing equipment in a ready and available status during the hot work activities. — Permit Issuer

5.4.22 Establish an emergency communication plan and assembly points during the pre-task tailgate. — Permit Issuer

5.4.23 Verify employees and contractors who are assigned hot work duties have training, knowledge, and skills to safely perform the assigned duties. Examples of job task training are listed below. — Permit Issuer

Fire Watch

- Able to communicate effectively with the workforce.
- Trained in the use of fire extinguishing equipment.
- Familiar with the facilities and the procedures for sounding an alarm in the event of a fire.

	Worker • Understand the Hot Work Protocol. • Knowledgeable on the type of hot work being performed. • Familiar with the facilities and procedures for sounding an alarm in the event of a fire.	
5.4.24	Write a hot work permit for the date of issue to include a maximum duration of 12 hours, or one complete work shift.	Permit Issuer
5.4.25	Ensure a hot work permit is not extended crew changes for the person performing the hot work or for the supervisor of the hot work.	Permit Issuer
5.4.26	Post the hot work permit in the immediate vicinity of the actual work site while hot work operations are in progress. **Note**: A hot work permit is valid only for a specific type of work and location described on the permit.	Permit Issuer
5.4.27	Stop all hot work activities if one of the following occur: • An actuation of an emergency shut down (ESD) system • The sounding of a fire or gas alarm • The detection of any other non-permitted or unsafe condition at the worksite.	Employees

5.5 SPECIAL CONSIDERATIONS

Step	Required Action	Role
5.5.1	Review requirements for Hot Work on Atmospheric Storage Tanks and Pressure Vessels in appendix A, when hot work will be performed on these types of equipment.	Permit Issuer
5.5.2	Avoid hot tap operations, if possible.	Employee/Contract Company Representative
5.5.3	Follow the Natural Gas O&M Manual Hot Tapping Procedure (192.627) or equivalent when performing hot tapping activities.	Employee/Contract Company Representative
5.5.4	Consult the appendix B, for additional information on hot work involving pipe plugs.	Permit Issuer/Line Supervisor

5.5.5	Set gas cylinders and welding machines outside confined spaces when welding or cutting is being performed in any confined spaces. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.	Employee/Contract Company Representative
5.5.6	Shut off the fuel gas and oxygen supply to the torch outside the confined space whenever the torch is not to be used for over a one-hour time period. Where practicable the torch and hose shall also be removed from the confined space.	Employee/Contract Company Representative
5.5.7	Remove electrodes from holders and locate holders to avoid accidental contact cannot occur when arc welding is suspended for a time period over one hour.	Employee/Contract Company Representative
5.5.8	Provide general mechanical ventilation when welding or cutting is done in a confined space that is less than 10,000 cubic feet per welder, or in a confined space with a ceiling height of less than 16 feet. The minimum rate will be 2,000 cubic feet per minute per welder.	Permit Issuer

6. TERMS AND DEFINITIONS

Cad Welding	A form of thermite welding used to bond wire to metal.
Contract Company Representative	A contractor who is assigned responsibilities, oversight and acts as Devon's on-site representative following and implementing the protocol steps as an employee would, for a specific task that requires adherence to Devon EHS Protocols.
Electrically Classified Area	A location in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures, which requires electrical equipment to be gas tight (see National Electrical Code and American Petroleum Institute [API] Recommended Practice [RP] 500).
Combustible Material	A substance that can be ignited and burned (e.g., cardboard boxes, filters, paper trash, ground cover like dry grass and brush, textiles, plastics, paper).
Designated Safe Hot Work Area (Non-Permit-Required Area)	An area free of combustible and flammable materials and constructed of noncombustible or fire-resistant construction materials. A designated safe hot work area cannot be located in an electrically classified area.
Fire Watch	An individual assigned to monitor the hot work activity.
Flammable	Capable of igniting easily, burning intensely or spreading flame rapidly.
Greenfield	Facilities and locations which have not contained hydrocarbon materials, and are not connected to an existing facility, equipment, or piping system that has contained hydrocarbon materials.
Hot Tap	A technique of attaching connections, such as weld-o-let or split tees, to equipment in service by welding.
Hot Work	Using tools and/or equipment that may create an arc, spark, or open flame (e.g., electric or gas welding, cutting, brazing, burning, grinding, use of an oxyacetylene torch, or similar operations, including manually lighting production equipment).

Intrinsically Safe	Equipment that is safe to use in an electrically classified area or a potentially hazardous area that may contain fuel in the atmosphere, such as flammable gasses or vapors, or combustible dust.
Lower Explosive Limit (LEL)	A concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (such as heat, arc, or flame) is present. At concentrations lower than the LEL, the mixture is too lean to burn.
Isolation	Using one of the following methods to isolate piping or equipment: • Disconnected equipment with blind flange installed. • Full-thickness blind skillet with gaskets on the pressure side. • Spectacle blind with gaskets on the pressure side. • Use of a block valve in conjunction with Lockout/Tagout.
Occupational Exposure Limits (LEL)	An 8-hour time weighted average exposure limit, designated by Devon.
Permissible Exposure Limit (PEL)	An 8-hour time weighted average exposure limit, designated and enforceable by the United States Occupational Safety and Health Administration.
Permit Issuer	Individual who has completed the required training and is authorized to write hot work permits.
Permit Receiver	Individual who has requested a hot work permit, for work tasks that will be performed.
Purge	Remove the contents within pipe or equipment and replace it with another gas or liquid.
Render Inert	Change the contents of an enclosure, vessel, or piping by using an inert substance (i.e., nitrogen or water) to render the atmosphere incapable of supporting combustion.
Unclassified Area	A location not electrically classified as a Class I, Division 1, or Division 2 area. (See API RP 500.)[1]

7. DOCUMENT MANAGEMENT

7.1 REVISION DETAILS

The specific changes made to this Protocol during the latest revision can be found in the Approval, Review, and Modification History (Attachment A).

7.2 APPROVAL

This procedure has been approved by:

Name	Title
Garrett Jackson	VP, ESG & EHS

7.3 SEEKING AND APPROVING VARIANCES

Variances to this document will be submitted in accordance with the EHS Document Control and Records Management Protocol.

7.4 RELATED DOCUMENTS

Document Name	Link
NORM Implementation Plan	
Natural Gas O&M Manual Hot Tapping Procedure (192.627)	
Available Through IHS Engineering Workbench	
Note: There are two different access points for the IHS Engineering Workbench. Select link below that fits your office location. A QRC is available here.	
Oklahoma City	Field Office
American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section IX, Welding and Brazing	
American Petroleum Institute	
RP 12R1, Setting, Maintenance, Inspection, operation and Repair of Tanks in Production Service IHS Engineering Workbench	
RP 500, Classification of Locations for Electrical Installations at Petroleum Facilities	
RP 2201, Practices for Welding or for Safe Hot Tapping on Equipment in Petroleum and Petrochemical Industries	
RP 2009, Safe Welding, Cutting and Hot Work Practices in the Petroleum Industry	

Specification 12D, Field Welded Tanks for Storage of Production Liquids
Specification 12F, Shop Welded Tanks for Storage of Production Liquids
Code 510, Pressure Vessel Inspection Code
Code 570, Piping Inspection Code
Standard 650, Welded Steel Tanks for Oil Storage
Standard 653, Tank Inspection, Repair, Alteration and Reconstruction
Standard 1104, Welding of Pipelines and Related Facilities
NFPA 70, National Electrical Code, Article 500

7.5 CITED DOCUMENTS

Reference #	Citation or Source
1	RP 500, Classification of Locations for Electrical Installations at Petroleum Facilities
2	29 CFR 1910.252(a)(2)(i) – Welding, Cutting and Brazing

8. ADDITIONAL RELATED INFORMATION

8.1 TRAINING AND CERTIFICATION REQUIREMENTS

Step	Required Action	Role
8.1.1	Verify all Devon affected employees involved in hot work operations have completed the Hot Work Awareness Training before assigning them hot work duties.	Line Supervisor
8.1.2	Verify Permit Issuers have completed training on the Hot Work Protocol and have successfully passed the Hot Work Permit Issuer Training. This training is restricted to only Devon Energy employees and contractors who are acting as the Contractor Company Representative.	Line Supervisor
8.1.3	Ensure contractors performing hot work duties have the necessary experience and required regulatory training for the task and are trained on their procedure or provided awareness level training on the Devon protocol. Contractors who are issuing hot work permits under their protocol/permit, must provide proof of training, and include the Devon Energy specific requirements into their permitting process.	Line Supervisor

8.2 RECORDS/LOGS/REPORTS

Record	Retention Period
Hot Work Permit at PSM Facility	1 Year
Hot Work Permit inside a confined space	1 Year

8.3 FORMS

Hot Work Permit

APPENDIX A: HOT WORK ON ATMOSPHERIC STORAGE TANKS AND PRESSURE VESSELS

Atmospheric storage tanks and pressure vessels in the oil and gas industry present a significant explosion hazard if ignition sources are introduced. When repairs involving hot work are to be done, there are safety considerations that must be evaluated before beginning any work.

Commercial Drums and Chemical Barrels

Commercial drums and chemical barrels are usually made of light-gauge material and are not designed to withstand pressure. Pressure shall not be applied to any flathead drum. Welding or oxyacetylene cutting on a closed drum (with or without bung closure) shall be prohibited.

Pre-Work Evaluation

The metal condition, characteristics, and wall thickness of atmospheric storage tanks and pressure vessels must be determined before any hot work begins inside or outside the tanks/vessels. The suitability and compatibility of the metals to be joined must be considered before any repair is attempted.

Preferred Hot Work Methods

There are several methods available to safely accomplish hot work on atmospheric storage tanks and pressure vessels. Some of the methods are listed below in order of preference:

1. All connections must be isolated, disconnected, blinded, double blocked and bled, and energy sources locked/tagged out. The tank or vessel and associated piping then shall be depressurized, drained, thoroughly cleaned, and rendered vapor-free.
2. For external hot work, the tank or vessel must be drained and cleaned and the vapor space continuously purged with steam or other inert gas.
   CAUTION: Cooling of sealed tanks may create a vacuum and damage the Tanks.
3. Additional vapor freeing or inerting of the vapor space shall be done if hot work on the tanks is to be done on the deck or on the top.
4. Welding on tanks that contain flammable/combustible liquids or produced water shall only be done at least 3 ft. (0.9 m) below the liquid level. The liquid level must be monitored to ensure that welding remains at least 3 ft. (0.9 m) below the liquid level line.
5. Thickness measurements in the welding area shall be taken to limit the possibility of burn-through.
6. Welding or other hot work on “live” tanks is considered similar to hot tapping, and all the same approvals shall be obtained in advance.
7. Welding or hot work on the top of, or in the vapor space of, tanks or vessels containing hydrocarbons shall be prohibited.

Prohibited Hot Work

Hot work or hot tapping on pressure vessels while under pressure shall be prohibited in the following circumstances:

- Areas where metal is laminated

- Where high-tensile-strength alloy steels or if steel requires stress-relieving or post weld heat treatment
- When in hydrogen service
- Where flammable/air mixtures are present
- When the chemicals in the vessel decompose with heat (e.g., acids or chlorides)
- In caustic or amine service with specifications for stress relieving
- When unsaturated hydrocarbons (e.g., ethylene) are in the vessel
- On compressed air receivers or vessels in oxygen service

Storage Tank Repair

The following specification atmospheric storage tanks shall be repaired in accordance with API RP 12 R1, "Setting, Maintenance, Inspection, Operation and Repair of Tanks in Production Service":

- API-12B, "Specification for Bolted Tanks for Storage of Production Liquids"
- API-12D, "Specification for Field Welded Tanks for Storage of Production Liquids"
- API-12F, "Specification for Shop-Welded Tanks for Storage of Production Liquids"
- Tanks fabricated to API Standard 650 or its predecessor (API standard 12C) shall be maintained in accordance with API Standard 653, "Tank Inspection, Repair, Alteration and Reconstruction."

APPENDIX B: PIPE PLUGGING PRACTICES

Pipe Plugging Practices

Considerable preparations and special precautions (Job Hazard Analysis) are required when test/plumbers plugs are used.

Follow the steps in the table below to assure minimum risk in the use of test/plumbers plugs:

Step	Required Action	Role
1.0	Verify with the PIC the line to be worked on.	Line Supervisor
1.1	Isolate the block values as per the Energy Isolation Protocol to isolate the section of line to be worked on.	Line Supervisor
1.2	Purge lines of flammable materials using standard industry purging methods.	Line Supervisor
1.3	Install blinds or double block and bleed method to isolate the line and prevent pressure build up.	Line Supervisor
1.4	Cold cut the line.	Line Supervisor
1.5	Clean the inside of the line, of any hydrocarbon residual, along with scale and sludge.	Line Supervisor
1.6	Install the proper plugs. **Note**: Install the plug far enough back in the line to eliminate damage to the neoprene seal by the welding heat.	Line Supervisor
1.7	Attach vent hoses to plugs to assure that pressure will not build up behind the plug. Ensure the vent hose is not crimped, is of sufficient length to safely discharge all releases downwind of the welding and is positioned so the end is visible to individuals at the welding scene.	Line Supervisor

1.8	Secure crows feet connection with safety clips to prevent accidental separation and leads at the connection.	Line Supervisor
1.9	Pick up spills around the welding area and remove using vacuum truck.	Line Supervisor
1.10	Remove contaminated soil from the welding location and dispose of it properly.	Line Supervisor
1.11	Sufficient firefighting equipment shall be readily available if a fire occurs.	Line Supervisor
1.12	Test the plugs with a combustible gas detector around the circumference of the plug and at each threaded connection to detect possible hydrocarbon leakage.	Line Supervisor
1.13	Halt welding operations upon an indication of liquid discharge or pressure build up.	Line Supervisor

ATTACHMENT A: APPROVAL, REVIEW, AND MODIFICATION HISTORY

Revision Number	Approved/Revised /Reviewed By	Approval/Revision /Review Date	Description (Initial Approval, Revision, or Review along with further details of revision if needed)
00	Richard Luedecke	2/6/12	▪ Initial Approval
01	Richard Luedecke	6/05/12	▪ Revision - Modified the definition of combustible material to specify ground cover like dry grass and brush instead of grass; ▪ included vehicles that transport produced water with vehicles that transport hydrocarbons; ▪ changed “on-line production equipment” to “above ground production equipment”; ▪ added an exemption for vehicles traveling on established roads within 10 foot of above ground hydrocarbon equipment; ▪ clarified that opening energized equipment was hot work when in an electrically classified area, ▪ added a section on Green Facility Construction; ▪ clarified the Burn Ban condition approval; ▪ removed the requirement to have a pumped monitor and the requirement to perform atmospheric monitoring if the only hazard is a combustible material; ▪ clarified steps 3.4.12-3.4.14; ▪ removed the requirement to have an 20 lb. ABC extinguisher, and changed it to require the appropriate extinguisher; ▪ added permit start time/permit valid time to permit; ▪ added specific requirement for lighting fired production equipment, instead of only performing LEL monitoring.
02	Richard Luedecke	07/30/14	▪ Revision - Specify that daily approval is required to perform hot work during a burn ban (3.3.6)
03	Richard Luedecke	12/06/16	▪ Modified step 3.2.3 to allow for the removal of step 3.2.4. ▪ Added a “date” field for the Hot Work Permit.

			▪ Added language that clarified who can receive the Devon Energy Permit Issuer training course. ▪ In conjunction with the permit issuer training, added details for what the performance level general contractors must have when issuing a hot work permit using the contractors program.
04	Richard Luedecke	4/26/18	▪ The step was modified to include a 10 foot / electrically classified area threshold for equipment and activities listed in the step. ▪ Aligned terms used to describe pre-job planning activities. ▪ Removed a reference API Publication 2209 – Pipe Plugging Practices.
05	Jim Farrell	6/25/2019	▪ Added requirement to complete a hot work permit before beginning hot work activities in areas under burn ban conditions. ▪ Removed face shield PPE requirement when manually lighting fired production equipment. ▪ Updated language to include approval under burn ban conditions. ▪ Updated sustained wind speed table.
06	Laura Wright	2/10/2020	▪ Administrative change to update last revised date, correct hyperlinks, and add Attachment A back into protocol.
07	Garrett Jackson	11/6/2023	▪ Removed steps addressing greenfield constructions sites from Hot Work Hazard Assessment section (5.2) and incorporated those requirements into Potentially Hazardous Area section (step 5.1.1). ▪ Added note to step 5.1.1 to address checking areas prior to starting hot work. ▪ Added new step in Hot Work Preparation section (5.3.2) to verify equipment does not contain flammables prior to starting hot work and the requirements if flammables are discovered.