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1.0 Purpose

1.1. To verify in writing, that proper safeguards and precautions have been taken to minimize the possibility of personnel injury and property damage during hot work.

1.2. To provide requirements for the testing, site preparation and communications required between Owning Departments or anyone performing hot work.

2.0 Scope

2.1. This procedure applies to all Marathon Petroleum Company (MPC) LP employees performing hot work at the Galveston Bay Refinery (GBR). It also applies to all consultant agencies, contractors, and subcontractors performing hot work at GBR.

2.2. This procedure applies to all hot work performed at GBR.

2.3. A properly authorized safe work permit including the hot work section and authorizing signatures is required for all cutting, burning, welding, use of non-explosion proof portable power tools or electrical equipment at Galveston Bay Refinery (GBR). This procedure applies to all hot work performed at GBR.

2.4. All areas on GBR property where hot work will occur will require a hot work permit.

2.4.1. More information on the Safe Work Permits can found in GBR PR-3 Safe Work Permit Procedure.

2.5. All Work Permits must be issued in accordance with instructions contained in this procedure before the performance of any type of work or activity in the covered areas.

3.0 Procedure

3.1. Responsibilities

3.1.1. Owning Department

3.1.1.1. Grant permission for personnel to work on equipment in their area.

3.1.1.2. Ensure the correct issue and cancellation of Safe Work Permits in the area and/or equipment under their control. Communicate the permit conditions to the Servicing Group representatives. Ensure the permit recipients fully understand the requirements of the Safe Work Permit.

3.1.1.3. Ensure that hot work operations remain consistent with the terms of the Safe Work Permit.

3.1.1.4. Prepare equipment for release to the Servicing Group following all applicable operating and HES procedures, so it is safe for the intended work.

3.1.1.5. Identify any hazards associated with the work and the actions or required means to safely mitigate the hazards.

3.1.1.6. Conduct joint job site visits with the Servicing Group representative(s) to verify that all precautions are in place, all necessary PPE is available, the area is inspected for fire and explosion hazards and that site conditions are acceptable to proceed with the work scope.

3.1.1.7. Notify Servicing Group employees of any operating emergency or changes in conditions that could affect the safety of the job.

3.1.1.8. When applicable and practical, require that attended hot work be done in an area outside of process units or dike areas.

3.1.1.9. Be competent (by virtue of training or experience) in the field on calibration and use of the instrumentation utilized to monitor atmospheric conditions, perform required atmospheric monitoring for permitted work and advise all applicable personnel of monitoring results.

3.1.1.10. Communicate to relief, any ongoing hot work in their area.

3.1.2. Contractors/Maintenance/Hot Work Servicing Groups

3.1.2.1. Be knowledgeable of and adhere to the provisions of this procedure.

3.1.2.2. Contact a permit writer prior to the commencement of any hot work so a Safe Work Permit can be issued. Comply with all permit requirements (e.g., appropriate PPE, precautions, special requirements).

3.1.2.3. Understand the scope and impact of the identified work, and ensure the Owning Department has a complete understanding of the job's execution requirements and job scope to verify proper equipment preparation.

3.1.2.4. Conduct joint job site visits with the Owning Department for the work to be performed and convey any potential hazards that will be introduced to the job site while performing work.

3.1.2.5. Ensure that all equipment (e.g., cords, leads, hoses, cylinders, regulators, weld machines, electric tools, etc.) is in good working condition and acceptable for the job to be undertaken.

3.1.2.6. Provide a dedicated, properly trained fire watch when required and discontinue the job if conditions are unsafe or if notified by the fire watch of an unsafe condition or problem.

3.1.2.7. Notify the Owning Department of any work scope changes.

3.1.2.8. Clean up the job site upon the completion of work.

3.1.2.9. Inform the Owning Department when the job is complete. Visit the site with operations to view the work and job site clean up status and properly turn in Safe Work Permit.

NOTE: Welders must be able to provide personal welder qualifications to MPC upon request.

3.1.3. MPC Supervision/Contractor Coordinators/Contractor Management

3.1.3.1. Ensure that all work carried out by personnel under his/her control is covered by a valid Safe Work Permit and that personnel comply with all precautions specified on the permit and all GBR HESS rules and procedures. This must be done while understanding all limitations and restrictions of the permit.

3.1.3.2. Ensure that all precautionary measures specified on the Safe Work Permit, employee PPE, acceptable equipment, etc., is in place prior to work commencing.

3.1.3.3. Those planning hot work shall ensure that the provisions of this procedure and all other applicable HES rules and procedures are included in the scope.

3.1.3.4. Ensure that employees performing work are properly informed of GBR PR-3 Safe Work Permit Procedure and of the provisions set forth in this procedure.

3.1.3.5. Ensure that the fire watch personnel are available at the site when required and have the proper fire suppression equipment, are knowledgeable in its use, understand their duties and were properly trained.

3.1.3.6. Verify the qualifications of welders with the Inspection Department to ensure that they are properly qualified.

3.1.4. Fire Watch

3.1.4.1. Be knowledgeable in all assigned responsibilities of the Fire Watch and all conditions noted on the Safe Work Permit.

3.1.4.2. Know how to sound an alarm (air horn) and/or contact emergency personnel in the event of a fire or changing conditions.

3.1.4.3. Be positioned such that they can have clear line of sight and can readily respond to any potential fire hazard resulting from the hot work. Fire watch must not be assigned any work that shall interfere with fire watch responsibilities.

NOTE: In some case's a Fire watch may be assigned a dual role as Confined Space attendant

3.1.4.4. For hot work jobs at elevated heights where the fire watch is positioned at ground level, the work crew must also have an additional 20 lb fire extinguisher with them at the elevated job site.

NOTE: This is in addition to the 20 lb extinguisher that the fire watch is required to have near their person.

3.1.4.5. Must be trained and knowledgeable in the use of fire extinguishers, extinguishing small fires, the provisions set forth in this procedure and of the hazards involved in the work scope.

3.1.4.6. Must be trained and knowledgeable in proper monitoring and response to alarms of a combustible gas testing instrument, if applicable.

3.1.4.7. Remain in the most suspect areas for a fire to occur while the hot work is being performed, and remain in the hot work area at all times while it is in progress.

3.1.4.8. Stop all activities when the emergency siren is activated, when a deviation from the provisions set forth on the Safe Work Permit is observed or when changing conditions are observed that would adversely affect employees and/or equipment.

3.1.4.9. Wear an orange or red vest for identification purposes.

3.1.4.10. A fire watch shall be maintained for at least a half-hour after completion of welding or cutting operations if combustible materials are present and have the possibility to flare up.

3.1.5. Permit Writer

3.1.5.1. Know the hazards that could be encountered during the permitted work, including information on each potential hazard, including exposure mode (skin contact, inhalation, etc.), exposure signs and symptoms, and the consequences of an exposure.

3.1.5.2. Inspect the work site before the work begins and ensure the hot work operations remain consistent with the terms of the Safe Work Permit.

3.1.5.3. Determine when testing and/or monitoring is required to demonstrate the safety of the job site. Be competent (by virtue of training and/or experience) in the field on calibration and use of the instrumentation utilized in testing and monitoring.

3.1.5.4. Be able to perform required atmospheric monitoring for permitted work, delegate this responsibility to the operator in charge of the area where work will take place or delegate to another competent member of the Owning Department.

3.1.5.5. Ensure that the testing/monitoring results are accurately documented on the Safe Work Permit. Determine time intervals in which atmospheric monitoring should occur if circumstances would necessitate that more frequent testing is needed.

3.1.5.6. Verify that all needed entries have been made on the permit, that all tests specified have been conducted and within acceptable limits, and that all procedures and equipment specified are in place before signing the permit and allowing hot work to begin.

3.1.5.7. Review compliance requirements and approve/terminate hot work. Terminate and cancel the hot work operations if an emergency arises or when conditions change from those under which approval was granted.

3.1.5.8. Conduct hazard discussion with the employees who will perform the hot work. The permit writer may discuss the hazards with the servicing representative(s) or elect to discuss with all involved employees directly.

3.1.5.9. Determine if a fire watch is required and if so, instruct and discuss the individual's responsibilities.

3.1.5.10. Contact the Safety Department for special testing and protective equipment requirements if needed.

3.1.5.11. Permit writers must complete initial permit writer training and scheduled refresher training.

3.2. General

3.2.1. All hot work must be performed in accordance with this procedure, and when practical, it shall be done in a designated safe welding and burning area, outside of process units or dike areas.

3.2.2. All welding and burning equipment (e.g., leads, grounds, hoses, cables, gauges, regulators, etc.) shall be visually inspected daily, prior to hot work occurring to ensure that it is in good working condition.

3.2.3. Pollution prevention equipment (e.g. secondary containment berms) shall be used at the Docks to prevent spills and/or releases of fluids to the environment. Weld machines must also be positioned such that exhaust will not negatively impact the atmosphere of employee working areas (e.g., CO build up).

3.2.4. 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

3.2.5. A hot work permit issued for welding is understood to cover approval of the location of the weld machines.

3.2.6. Consideration must be given to the positioning of other spark producing equipment (e.g. light plants/towers, generators, compressors) outside of process and diked areas. The

positioning of such equipment must be treated as unattended hot work, included in applicable work scopes and permitted as such.

3.2.7. The immediate area will be in satisfactory condition prior to the start of any hot work. Walkways, stairways, ladders, tank man ways, and other approaches to the work area must be accessible and free from obstacles which may obstruct the access/egress of personnel in the event of an emergency.

3.2.8. Additional PPE may be required for certain hot work applications (e.g. welder PPE). Consideration must be given to exposure to weld fumes and respiratory PPE. Welders or employees performing hot work on any scaffold, walkway, or any other elevated area requiring fall protection shall don and use the PPE properly. Refer to PPE-1 Personal Protective Equipment section 4.7.1 and MPC Exposure Control Matrix (or through Marathon Safety App) to determine PPE and associated controls for applicable hot work tasks.

3.2.9. Adequate natural or mechanical ventilation shall also be considered to reduce or eliminate the hazards of exposure to weld fumes. Any accumulation of gases must be vented to a safe location, away from the hot work.

3.2.10. Sewers within 35 feet must be protected with a catch basin or flat style drain cover. In areas where this type of arrangement will not work or where it is not practical, wet fire blanketing may be used to cover these areas.

3.3. Hot Work Permitting

NOTE: Every hot work job is unique and may have unique hazards. All steps and consideration necessary to ensure a safe work environment shall be addressed prior to commencing work.

3.3.1. Hot work permits must be issued in the proper form and properly signed and countersigned before starting any work or activity that could produce an ignition source. Hot work must be permitted in accordance with guidelines set forth in the GBR PR-3 Safe Work Permit Procedure and this procedure. When a hot work permit has been issued, a cold work permit is not required for the same craft for the same job. A group permit may be issued when a job is known to require more than one craft and the work is under the control of the area maintenance supervisor.

3.3.2. Cutting, burning, welding, producing sparks, etc., will require a dedicated fire watch.

3.3.2.1. Additional fire watches may be required based on the hazards of the work being performed.

3.3.2.2. A fire watch shall be maintained for at least a half-hour after completion of welding or cutting operations if combustible materials are present and have the possibility to flare up. This is to detect and extinguish possible smoldering fires.

3.3.2.3. Fire watch personnel will wear a red/orange vest for identification.

3.3.3. Adequate firefighting equipment (water hose and/or, fire extinguisher and/or, fire resistant shield/blanket, etc.) must be maintained while the hot work is in progress. In all cases, at least a minimum 20 lbs. fire extinguisher will be required. When making this designation, the class of fire extinguisher should be made as well. The extinguisher shall have a clearly labeled class designation on it. Many extinguishers cover multiple classes. For example, some cover classes A and B, some cover class B and C, some cover A, B and C.

3.3.3.1. Class A fires include fires that involve wood, paper, cloth, etc.…

3.3.3.2. Class B fires include fires that involve combustible liquids such as gasoline.

3.3.3.3. Class C fires involve energized electrical equipment. If electrical energy has been removed from equipment, it can be treated as class A.

3.3.3.4. Class D fires are fires that involve combustible metals (ex. Titanium).

3.3.3.5. Class K extinguishers are intended for deep fryers. They are also safe to use on class C fires. Use of a class K extinguisher is unlikely.

3.3.4. Identification of a readily available fire extinguisher should be completed during the JJSV and documented on the SWP and/or JSA. The work party must be well aware of the location of the fire extinguisher to be used in an emergency.

3.3.4.1. The Servicing Group shall provide fire extinguishers for all attended hot work.

3.3.4.2. Outside of process areas (OSBL), the Servicing Group shall provide fire extinguishers for all hot work (attended & unattended).

3.3.4.3. In process areas, it may be acceptable to use the unit operations fire extinguishers in some cases for unattended hot work with the Owning Departments approval. The fire extinguisher shall be left in its stored location unless needed for a fire emergency.

3.3.5. When cutting with a torch, welding or grinding, evaluate the impacted area of hot slag/sparks and protect sewer openings, doorways, man ways, cracks in flooring, areas of employee foot traffic, etc., within 35'. Employees must set up the work site to achieve 100% spark containment at the welding/cutting location with the use of fire blanketing or other fire resistant material.

3.3.5.1. **Note:** All fire/welding blankets shall be FM Approved.

3.3.6. The site preparation shall comply with other applicable Galveston Bay Refinery procedures/standards (e.g., safe work permitting, energy isolation, confined space, etc.).

3.3.7. Atmospheric testing must be performed in the immediate area following the guidelines set forth in the GBR PR-3 Safe Work Permit Procedure and recorded in the appropriated section of the Safe Work Permit. At times, depending on the hazard and conditions, continuous monitoring may be required. This is to be determined by the Owning Department in conjunction with the appropriate Maintenance Coordinator.

Acceptable conditions are as follows:

3.3.7.1. Oxygen concentration between 19.5% and 23.5%

3.3.7.2. LEL concentration of 0 – 10% (Confined Space is 0%)

3.3.7.3. CO concentration of 25 ppm or less

3.3.7.4. H2S concentration of less than 10 ppm

NOTE: Other materials may have to be tested for on a case by case basis. Some gases considered toxic (not all inclusive) are: Hydrogen Sulfide (H2S), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Ammonia (NH3), Sulfuric Acid (H2SO4), Hydrochloric Acid (HCl). For more information, see GBR PR-1 Confined Space Entry and GBR PPE-5 Respiratory Protection.

NOTE: Combustible dust shall be cleaned from the immediate vicinity of the hot work operations. This includes equipment, machines, overhead structures and floors.

NOTE: Though sewers, drains and like areas are to be identified and covered with adequate fire resistant drain covers/shielding, these points are to be included as part of the thorough atmospheric test of the hot work area.

3.3.8. Prior to the use of any atmospheric testing equipment, users must assure themselves that the instrument is properly calibrated and in good working condition. For more information see GBR EQ-7 Portable Gas Testing.

3.3.9. Gas tests will be made after all blinding, disconnecting, purging, steaming and other preparatory work has been completed and in as short a time as practical prior to the start of work. In every instance a test must be taken within two hours prior to the start of work. When work is not started within two hours of the time the gas tests were taken, another test must be made with results shown and initialed by the person making the second test.

3.3.10. Continuous monitoring with a gas testing instrument may be deemed necessary to continuously monitor the hot work site. Continuous monitoring is required if attended hot work is performed on a live unit or within 35 feet of live process equipment.

3.3.10.1. If continuous monitoring is conducted, a minimum of one, properly located, gas testing instrument shall be provided at the work site prior to beginning hot work.

3.3.10.2. Continuous monitors must have capability of alerting personnel remotely, or personnel must be assigned to observe the continuous monitor.

3.3.11. All necessary isolations and related precautions must be completed prior to the commencement of any hot work (e.g., de-energizing, locking and tagging, disconnecting, blinding, de-pressured, plugging, purging, ventilating, flushing, or otherwise cleaning). This is to help ensure that no hazard will be introduced or created by subsequent work.

3.3.12. No additional work activities such as sample catching, truck unloading of combustible or flammable liquids, breaking into pipelines or equipment that contain combustible material, etc., shall be permitted within a 35 foot radius of hot work in progress in an operating unit. Consideration must be given to wind direction, etc.

3.3.13. Consideration must be given for barricading the area directly below the spark producing work and area where there is a potently of sparks/slag falling. Barricading must comply with GBR-HESS-EQ-09 Barricades.

3.3.14. In some cases, a water hose must be charged and ready to wet areas that may be negatively impacted, where sewer covers/fire blanketing need to be kept wet or where there is any possibility of combustible materials igniting by the hot work, falling sparks, slag, etc. However, every effort must be made to remove combustible material in the area of sparks/slag before this type of work is performed.

3.3.15. Effort must be made to route leads and hoses overhead and/or out of walkways to prevent creating tripping hazards.

3.3.16. Ensure that heat conduction and/or heat radiation cannot occur through walls, roofs, pipes, etc. and ignite nearby flammable or combustible materials. Consideration shall be taken to break/disconnect adjacent lines and/or materials (e.g. steel members, pipes, etc.) where heat from the hot work could be transmitted.

3.3.17. Ensure that all flammable materials are in appropriate storage area (e.g. cabinet, cage).

3.3.18. Ensure that fixed fire suppression systems have not been impaired. If one or more of these systems must be taken out of service to accomplish the hot work, additional portable or fixed fire protection equipment shall be available at the site.

3.3.19. The Owning Department shall discuss the scope and duration of the planned job with the employees performing the hot work and conduct the appropriate joint job site visit. The joint job site visit shall include verification of but is not limited to the above listed items.

3.3.20. When welding is suspended for a substantial period of time (e.g., lunch, breaks, shift change, etc.) all electrodes are to be removed from their holders and the machine is to be turned off and/or disconnected from its power source. For gas welding/burning in confined spaces, torches and hoses must be removed from the vessel and/or disconnected at the vessels.

3.4. Other/Miscellaneous

3.4.1. Hot work requiring burning, welding or open flames on any operating lines and equipment in-service or not established as gas free shall be carefully reviewed by the Owning Department Supervision or designee and Permit User Supervisor or designee as to the necessity of the work. A Job Safety Analysis should be performed with all safety precautions determined prior to work taking place.

NOTE: All in-service welds and hot taps must follow the GBR-HESS-PR-24 In-service Welding and Hot Tapping Procedure.

NOTE: Welding on steam lines while under pressure shall require all precautionary measures taken for similar work on oil and gas lines (e.g. in-service welds)

3.4.2. If there is any doubt as to whether any equipment is completely empty or gas free, holes may be drilled with approval of the Owning Department, engineering, safety, maintenance and/or inspection departments to establish safe working conditions. Repair of drilled holes shall be considered prior to the approval for drilling.

3.4.3. If a line cannot be made gas free, the line may be cold cut if it has been emptied and depressurized, the end of the line on which the hot work is to be performed shall be sealed tight with mechanical plugs (car-ber, lansas, cherne, etc…) or by other suitable means. The open end must be made gas free and any scale, etc., must be removed before hot work begins.

3.4.4. The affected Owning Department Supervision or designee shall counter sign all hot work permits involving the use of burning, welding, or open flames on any lines and operating equipment not established as gas free. The job site shall be reviewed by the Owning Department Supervision or designee to see that all precautionary measures have been taken prior to signing the hot work permit. Close Owning Department supervision must be maintained at all times. The Owning Department Supervision or designee shall designate a representative to be responsible for surveillance.

3.4.5. Burning/cutting into lines or other equipment with spark/heat creating tools not known to be oil-free and gas free is prohibited.

3.4.6. All out-of-service equipment (e.g. piping, towers, etc.) shall be isolated for hot work by blinding, disconnecting or other acceptable means, and must be made gas-free by steaming, washing or other accepted procedure before approval for hot work is given.

3.4.7. Hot work permits on lines connecting different Owning Departments shall be approved by the foreman of both departments and/or their designated representatives.

3.4.8. Atmospheric storage tanks present unique hazards when out-of-service. Special attention should be given to the floor, shell, roof, piping and hoses. Serving group shall take

appropriate precautions to confirm tank is hydrocarbon and gas free. Ensure product residue, wax, and scale are cleaned before hot work is performed.

3.4.9. When work on empty tanks with floating roofs is required, special precautions shall be made to ensure that all pontoon compartments as well as the tank seals are completely gas free before a hot work permit is issued. Personnel should be instructed to stay clear of roof vent hatches.

3.4.10. The opening of in-service explosion-proof enclosures or purged panels (e.g. opening electrical junction boxes) requires a hot work permit to ensure safety and compliance with hazardous area regulations.

3.4.11. Demister pads in vessels shall be removed prior to hot work if they pose a hazard due to the work activity being performed.

3.4.12. Structured packing shall be removed prior to hot work if it poses a hazard from hot work activity (or precautions shall be put in place to mitigate sparks or slag from contacting the packing).

3.4.13. At times during maintenance and construction it is necessary to erect and/or establish temporary fabrication areas. The following guidelines shall be adhered to when considering the establishment of such an area.

3.4.13.1. MPC Facility Siting Coordinator and the Contractor Coordinator (Job Rep) shall refer to GBR RGD-PS-000011-PS Building and Tent Siting for all temporary fabrication areas required for work.

3.4.13.2. Standard refinery PPE must be worn in the area. Spark producing hot work will require the use of the appropriate face shield, goggles, gloves, welders PPE, etc.

3.4.13.3. Work in temporary fab areas is considered hot work (attended) and should be permitted as such.

3.4.13.4. If the fab shop is an existing building, it must be well ventilated and have exits appropriately marked with emergency exit signs. Temporary enclosures must have adequate ventilation as well. Continuous air monitoring may be required.

3.4.13.5. As always, the cleanliness of the area must be maintained. Housekeeping must be addressed on every shift.

NOTE: Information regarding compressed gas cylinders, their use, storage, handling and other requirements can be found in 3.6 – Compressed Gas Cylinders

3.5. Temporary Portable Pumps

3.5.1. The Proceduralized Management of Change (PMOC Installation of Temporary Portable Pumps) must be completed prior to the start-up of any portable pump used to pump hydrocarbons inside tank dikes or unit battery limits.

3.5.2. 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.).

3.5.3. Temporary portable pumps shall not be used for pumps in hydrofluoric acid service.

3.6. Hot Bolting/Flange Tightening

3.6.1. Tightening Leaking Flanges or Connections

3.6.1.1. If a flange is leaking but not in amounts enough to give a combustible reading (LEL), a hot work permit will be issued. The method of hot bolting, use brass or non-sparking tools.

3.6.1.2. If a flange or connection is leaking enough hydrocarbon liquid or vapor and combustible readings are detected, again, a hot work permit is necessary but with stipulations on method used, such as:

3.6.1.2.1. Lower the LEL in the immediate work area to acceptable limits.

3.6.1.2.2. Use steam, inert gas, ventilation, etc., whatever acceptable means is necessary.

3.6.1.2.3. Fire watch with continuous monitoring, steam hose, fire extinguisher, etc., on hand.

3.6.1.2.4. Area barricaded and secured against non-essential traffic.

3.6.1.2.5. Sewers covered in case of possible ignition.

3.6.1.3. If a flange or connection is leaking and in a unit or process area where gas has escaped from some other source, but not enough to create an explosive or ignitable atmosphere, then a hot work permit is necessary and again, all conditions listed under 3.5.1.2 must be followed.

3.6.1.4. If a hazardous but non-combustible leak develops, such as steam, acid, caustic, amine, chemical injection, etc., other special precautions are required, such as, but not limited to, acid suits, gloves, face shields, goggles, rubber boots and possibly breathing air.

NOTE: Some leaks may be too excessive and may not be able to be handled under these hot bolting guidelines. Some cases may require unit shut down or isolation of the leaking equipment or flange.

3.6.2. Loosening

3.6.2.1. If a unit is shut down, it may be necessary to hot bolt flanges for blinding and man ways on towers for opening. In cases where units are totally hydrocarbon free and, depressurized a cold work permit may be issued for the above-described work. In this case, hammers and wrenches may be used. If impact wrenches are necessary, a hot work permit must be issued. Owning Department supervision will notify Maintenance personnel as to when hot bolting may be performed. Maintenance and Owning Department supervision shall determine how many bolts may be removed safely.

3.6.2.2. If the unit is shut down, but not totally hydrocarbon free, a hot work permit will be necessary for any hot bolting or loosening of flanges. The hot work permit must stipulate what tools (brass or non-sparking etc.) are allowed to be used and any other special safety precautions that must be followed. Bolts shall not be removed in a pattern that allows the gasket to fall out or become dislodged when draining lines by flange separation. Attachment A Flange Bolt Removal Guideline shall be followed when removing bolts on live equipment.

3.6.2.3. If no hydrocarbon is detected at the work site but the vessel or flange contains hydrocarbon, a hot work permit will be necessary due to area conditions. Impact wrenches and/or hammer wrenches can be utilized for four bolting. When removing the last four bolts, or the number of bolts specified by Maintenance and Owning Department supervision, other methods of unbolting that do not create sparks will be necessary.

3.6.2.4. If it is unknown whether the vessel or piping is gas free, the conditions specified in 3.5.2.3 must be followed, and perhaps others upon discussion with appropriate Owning Department supervision and maintenance representatives.

3.6.3. See SP-50-16 Bolted Joints in Piping and Fixed Equipment, Appendix B of ASME PCC-1 and ASME PCC-2 for further guidance.

3.7. Compressed Gas Cylinders

Compressed gas cylinders shall be used, handled, transported and stored in accordance with HESS Practice EQ-1 Compressed Gas Cylinders

3.8. Training

3.8.1. Training must be provided initially and periodically for all employees, whose assignment may involve hot work. The training must instruct employees in the procedures to be followed to minimize potential hazards.

3.8.2. Supervisors are responsible for ensuring that all employees have had the proper training prior to any assignment as a permit issuer, supervisor, fire watch, and any other specific training relevant to that specific aspect of hot work.

4.0 Definitions

4.1. ***Blinding*** – The absolute closure of a pipe, line or duct by installing a slip blind (spade), plug or cap which completely covers the opening, which extends at least to the outer edge of a flange's mating surfaces, and which is capable of withstanding the maximum upstream system pressure. A blank, slip blind, blind flange, cap, and/or physical disconnect are all considered to be blinds.

4.2. ***Bonding*** – The joining of metallic parts with an adequately sized conductor to form an electrically conductive path which will ensure electrical continuity and the capacity to safely conduct any current likely to be imposed.

4.3. ***Electrical Area Classifications*** – Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations shall include those specified below.

4.3.1. Class I, Division I – A location in which ignitable concentrations of flammable gases or vapors can exist under normal operating conditions, or in which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations, because of leakage, or in which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

4.3.2. Class I, Division II – A location in which volatile flammable liquids or flammable gases are handled, processed or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment.

A location in which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment.

A location that is adjacent to a Class I, Division I location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

4.4. ***Half Bolting*** – The removal of every other bolt (so the flange is left with half the number of bolts) during plant depressurization, usually when the system is close to atmospheric pressure. Note that half bolting is also referred to as odd-bolting or skip-bolting. See SP-50-16 Bolted Joints in Piping and Fixed Equipment,, Appendix B of ASME PCC-1 and see ASME PCC-2 for further guidance. (Consult with engineering support if any questions cannot be answered by the Maintenance and Operations team planning, permitting, and performing the work.) A variance shall be required if half bolting outside the maximum pressure allowances in Attachment A Flange Bolt Removal Guideline.

4.5. ***Hot Bolting*** – The sequential removal and replacement of bolts on flanged joints while the unit is under REDUCED operating pressure. The procedure generally consists of removing one bolt at a time in a predetermined cross pattern sequence, relubricating it, reinstalling it (or a new bolt), and retightening it to a specified torque before the next one is removed. See SP-50-16 Bolted Joints in Piping and Fixed Equipment, Appendix B of ASME PCC-1 and ASME PCC-2 for further guidance. A variance shall be required if hot bolting outside the maximum pressure allowances in Attachment A Flange Bolt Removal Guideline.

4.6. ***Hot Work*** – is repair, maintenance or construction activity, which requires the use of spark-producing equipment or open flame. All work requires a gas test and the presence of a fire extinguisher. However, some forms of hot work require a dedicated fire watch (attended) while other forms do not (not attended). Examples of those that require a fire watch (attended) include:

- Acetylene burning, welding and brazing.
- Electric arc welding.
- Annealing / Stress relieving ~ electric or gas.
- Use of open flames.
- Use of propane or gas fired heaters or boilers.
- Chipping, ripping, breaking, or sawing concrete or refractory.
- Cutting and grinding using a Metabo, Tiger wheel, or similar tool.
- Electric soldering.

Hot work examples that do not require a fire watch or dedicated fire extinguisher (not attended) includes:

- Vehicle entry.
- Use of non-explosion-proof electric equipment/ Non-Intrinsically Safe Electric and Battery powered tools
- Use of air-powered impact wrenches.
- Use of Powder Actuated tools.
- Use of gasoline- or diesel-powered engines (compressors, pumps, generators, power washers, etc.).
- Opening of in-service explosion-proof enclosures.
- Abrasive blasting using sand and other media.
- Grass cutting inside diked areas.
- Breaking or Sawing concrete (wet method)

NOTE: Hot tapping and welding on lines or equipment under pressure or not gas-free requires a special permit following the requirements of the GBR-HESS-PR-24 In-service Welding and Hot Tapping Procedure.

4.7. ***Inerting*** – The displacement of the atmosphere in a permit space, or other equipment, by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere will not support combustion.

5.0 References

5.1. OSHA 29 CFR 1910.252(a) – General Requirements for Welding, Cutting, and Brazing

5.2. GBR PR-3 Safe Work Permit Practice

5.3. GBR PR14 Energy Isolation

5.4. GBR PR-15 Blinding/Line Breaking Requirements

5.5. GBR EQ-7 Portable Gas Testing

5.6. GBR PPE-5 Respiratory Protection

5.7. GBR-HESS-PR-24 In-service Welding and Hot Tapping Procedure

5.8. GBR RGD-PS-000011-PS Building and Tent Siting

5.9. PMOC Installation of Temporary Portable Pumps

6.0 Attachments

6.1. Attachment A – Flange Bolt Removal Guideline

7.0 Revisions History

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Original Issue. Consolidated site procedure that replaces GBR-HESS-PR-02 and RSW-0067-TC under MOC 51281.	K. M. McBride	D. C. Staats	6/1/2018	11/26/2018
1	Technical Revision: Updated 3.6.2.2, Attachment A, 4.4, and 4.5 per R20181256-005 INC-166362.	C. T. Lamb	V. J. Meeks	2/20/219	2/20/2019
2	Updated to align with GBR RGD-PS-000011-PS (integrated under MOC 33609).	B. Huerta	V. J. Meeks	11/13/2019	12/17/2019
3	Updated to align with in-service bolting activity requirements with SP-50-16 per PSA 19-03.	C. T. Lamb	V. J. Meeks	3/26/2020	3/27/2020
4	Added “purged panels” reference in 3.4.10 to address audit recommendation and align with RSP-1162-000.	J. D. Bergeron	H. F. Sheard	5/28/2025	5/28/2025
5	Updated to add reference to PPE-1 and Exposure Control Matrix under MOC 157725.	J. D. Bergeron	H. F. Sheard	11/19/2025	11/19/2025

Attachment A Flange Removal Guideline

Notes:

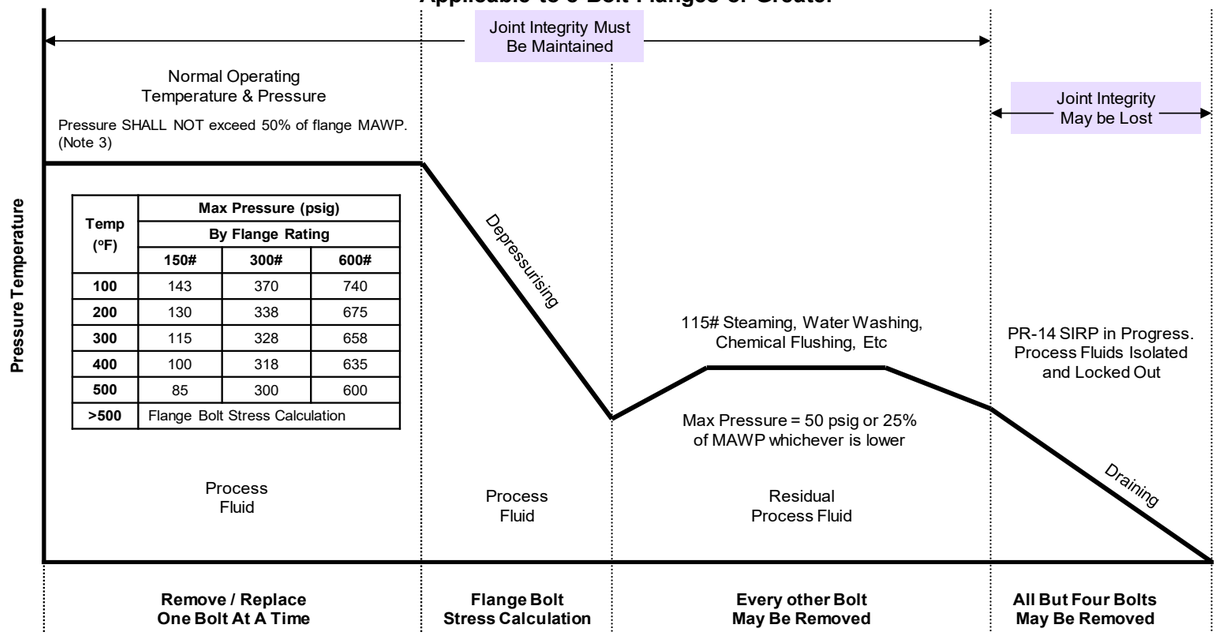
(1) Bolts shall not be removed in a pattern that allows the gasket to fall out or become dislodged when draining lines by flange separation.

(2) See SP-50-16 Bolted Joints in Piping and Fixed Equipment, Appendix B of ASME PCC-1 and see ASME PCC-2 for further guidance. (Consult with engineering support if any questions cannot be answered by the Maintenance and Operations team planning, permitting, and performing the work.)

(3) > 50% MAWP shall require an engineering and risk analysis per PCC-2

(4) A variance shall be required in order to do half bolting or hot bolting outside the maximum pressure allowances in Attachment A Flange Bolt Removal Guideline.

Flange Bolt Removal Guideline
Applicable to 8-Bolt Flanges or Greater



Temp (°F)	Max Pressure (psig) By Flange Rating		
	150#	300#	600#
100	143	370	740
200	130	338	675
300	115	328	658
400	100	318	635
500	85	300	600
>500	Flange Bolt Stress Calculation		