




# Dry Fork Station Procedure

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<b>Originator</b> Ashley Fraser	<b>Final Approver</b> 		<b>Date</b> 6/14/2021	<b>RMP</b> X
<b>Subject</b> Line Breaking and Line Penetration				

## 1.0 PURPOSE / SCOPE

- 1.1 To establish minimum requirements for safe line breaking, penetration or opening of lines or equipment.
- 1.2 To protect personnel from injury or illness due to the release or exposure to hazardous, corrosive, toxic, flammable or pressurized materials.
- 1.3 This procedure applies to equipment, man ways, lines or systems within the boundary limits of the plant site or related property. This procedure sets minimum standards and may be supplemented as required by local conditions or special situations.

## 2.0 DEFINITIONS OF TERMS

- 2.1 Hazardous Material: articles or substances which are capable of posing a risk to health, safety, property or the environment.
  - 2.1.1 Explosives
  - 2.1.2 Gases Under Pressure
  - 2.1.3 Flammable Liquids
  - 2.1.4 Flammable Solids
  - 2.1.5 Oxidizers and Organic Peroxides
  - 2.1.6 Poison and Infection Substances
  - 2.1.7 Radioactive
  - 2.1.8 Corrosive
  - 2.1.9 Acute or chronic health effects may occur in exposed employees
- 2.2 Line breaking: is the act of opening lines, vessels, or equipment where the potential exists to expose personnel to internal pressure or hazardous chemicals. (Opening of vents, drains, disconnecting hoses or bleed valves is not considered line breaking).
- 2.3 Line penetration: is the act of cutting, drilling, or torching lines or equipment with the intent of actually piercing the line or vessel.
- 2.4 Operating Authority: the Supervisory Staff in the Operation Section is the "Operating Authority" in the power plant and the administrator of this Line Breaking and Line Penetration Procedure. Operating Authority duties may also be assigned to the Lead Station Operator if necessary.
- 2.5 PSM/RM Program Covered Process: all activities and equipment involved with the receipt, storage, handling or movement of a substance included in either the PSM or RM Program regulations including utility systems, required for the safe operation of the Anhydrous Ammonia System. For purposes of this definition, any group of equipment that is



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interconnected and separate equipment that is located such that ammonia could be involved in a potential release shall be considered a single process.

- 2.6 Qualified Employee: a qualified employee is an individual that has been trained on and understands their responsibilities under the Line Breaking and Line Penetration Procedure.
- 2.7 Supervisory Authority: the Plant Manager is the “Supervisory Authority” of this Procedure and administers manning the installation, maintenance, and the operations of the procedure. This person may designate this authority if necessary.
- 2.8 Verified: to confirm by flow of flush liquid or air/CO<sub>2</sub>/nitrogen, open and clear bleeder within four feet of break point or some other method which proves that only residual material may be present. Other methods of verification may include:
  - 2.8.1 Instrumentation specific to the chemical hazard.
  - 2.8.2 Chemical (color change) indicators.
  - 2.8.3 Surface temperature of the external piping (indicating trapped liquid).

## 3.0 RESPONSIBILITY / APPLICABILITY

### 3.1 Applicability

- 3.1.1 This procedure applies to all employees and contractors within the boundary limits of BEPC facilities. Adherence to the policies and directives in this procedure is mandatory for all BEPC employees. Employees failing to follow this procedure are subject to disciplinary action up to and including termination of employment.
- 3.1.2 This procedure applies anytime process equipment or piping containing or having previously contained hazardous material is to be opened and cannot be verified as being cleared of hazardous material.

### 3.2 Responsibility

- 3.2.1 Safety Coordinator is responsible for:
  - 3.2.1.1 Ensuring initial and subsequent training is completed.
  - 3.2.1.2 Maintaining all training records.
  - 3.2.1.3 Ensuring that this procedure is reviewed on a regular basis.
- 3.2.2 Supervisory Authority is responsible for:
  - 3.2.2.1 Safe administration of this procedure.



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- 3.2.2.2 Designating the roles of responsibility for which individuals are qualified and entered into this procedure.
- 3.2.2.3 Enforcing the Line Breaking and Line Penetration Procedure and the disciplinary actions regarding violations of the procedure.
- 3.2.3 Operating Authority is responsible for:
  - 3.2.3.1 Issuing Clearances needed for a line break or penetration.
  - 3.2.3.2 Reviewing the JSA and line penetration/breaking precautions with employees prior to authorizing work when applicable.
  - 3.2.3.3 Training their employees initially and subsequently in these procedures.
  - 3.2.3.4 Providing proper training for the use of tools, equipment and personal protective equipment needed for this procedure.
- 3.2.4 Supervisors are responsible for:
  - 3.2.4.1 Training their employees initially and subsequently in these procedures.
  - 3.2.4.2 Providing proper training for the use of tools, equipment and personal protective equipment needed for this procedure.
  - 3.2.4.3 Enforcing these procedures and the disciplinary actions regarding violations of the program.
  - 3.2.4.4 Periodically inspecting the job site.
  - 3.2.4.5 Reviewing the JSA and line penetration/breaking precautions with employees prior to authorizing work.
- 3.2.5 Qualified Employees are responsible for:
  - 3.2.5.1 Following these procedures and reporting deviations to their immediate supervisors.
  - 3.2.5.2 Assessing the job site and work environment for hazards prior to commencing work.
  - 3.2.5.3 Verifying the clearance is in place and correct.
  - 3.2.5.4 Following the DFS Energy Verification Procedure.
  - 3.2.5.5 Reviewing or creating a JSA for the line penetration or break to be completed prior to commencing work.



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## 4.0 PROCEDURE / GUIDELINES

### 4.1 Guidelines

4.1.1 The minimum personal protective equipment shall include personal protective equipment as outlined in the Safety Data Sheet (SDS) for the substance/material in the process to be worked on.

4.1.1.1 Respirators (full face or half mask) shall be used if potential respiratory hazards are present.

4.1.1.2 Chemical protective suits, chemical goggles, chemical boots and a face shield shall be required if the line contains corrosive material, chemicals or anhydrous ammonia. A chemical protective suit and hood/full face respirator shall be worn if the line to be broken is overhead.

4.1.2 Warning – High temperature and extremely low temperature materials pose additional hazards not addressed specifically by this procedure. Precautions shall be addressed on the JSA.

### 4.2 Line Breaking or Penetration Procedure

4.2.1 Operations personnel responsible for the area in which the line or equipment is located, shall perform initial preparation for the line-breaking job. Wherever physically possible, double block and bleeds shall be used for isolation to provide an effective seal from operating systems.

4.2.2 The initial point of penetration shall be identified with paint, tape or other equivalent means. This initial point of penetration shall be verified by operations and maintenance personnel when the JSA is issued.

4.2.3 Existing low point drains between isolation valves shall be opened slowly to relieve pressure and drain liquids. Whenever piping configurations allow, the line shall be flushed or blown-down as is most appropriate for the product carried in the line. Precautions shall be taken to prevent exposure of personnel to hazardous materials or contamination of the environment.

4.2.4 The isolated line or equipment must be checked to assure zero pressure on the system. If the system cannot be depressurized, maintenance shall be notified and a suitable deflector must be rigged to prevent the expected release of product from contacting the person breaking the line.

4.2.5 When the responsible Operating Authority/Supervisor is satisfied that all preparation work has been completed, they shall note the protective equipment required and special instructions on the Job Safety Analysis (JSA) and review it with the qualified employees prior to authorizing work.



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- 4.2.6 When working with or assisting maintenance personnel in line breaking, operations personnel shall be required to wear personal protective equipment compatible with hazardous exposures.
- 4.2.7 The qualified employee(s) assigned to break or penetrate the line shall personally review the job with operations to assure all safety precautions are taken. The isolation, safe work practices and personal protective equipment shall be reviewed with the maintenance crew prior to any line breaking activities.
- 4.2.8 If the line could not be drained or blown down, a suitable deflector must be rigged to prevent the expected release of product from contacting the person opening the line.
- 4.2.9 The maintenance crew must follow all aspects of the JSA prior to breaking or penetrating the line. The personal protective equipment specified on the JSA must be used or exceeded for protecting the personnel assigned the task.
- 4.2.10 The qualified employee must assure the work area is adequately isolated to protect area personnel from exposure to possible sprayed material. Barricade tape or other equivalent means may be used for this purpose.
- 4.2.11 High-risk jobs involving potential exposure to hazardous or corrosive chemicals, such as line breaking, line penetration, chemical cleaning or transfer operations are not to be performed in areas with inoperable safety showers. Area safety showers shall be flow tested to ensure proper operation prior to beginning high-risk jobs. (Portable safety shower/eye wash stations are available from the warehouse if needed.)
- 4.2.12 If the bolts or nuts are in any manner defective, they must be replaced and tightened one at a time prior to breaking the line.
- 4.2.13 The individual breaking a line must break the flange bolts on the side away from them and loosen bolts and/or threaded joints slowly to check for pressure releases and to minimize the potential of being sprayed with product.
- 4.2.14 The use of a torch to penetrate a line or equipment is prohibited unless the line is drilled first to verify that the line is empty and de-pressured.
- 4.2.15 If known hazards such as toxic materials or corrosives have been present in a line, it shall be treated as full and dangerous. When lines have been disconnected, appropriate measures shall be taken to protect personnel from hazardous exposures. This might include personal protective equipment specific to the hazard, blinding, blanking or capping the end of the disconnected piping, etc. If maintenance personnel leave the area and open-ended piping exists, the area shall be barricaded to prevent inadvertent exposure for other plant personnel.
- 4.2.16 When a section of piping is removed from a system, positive isolation of the open system must be assured.



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- 4.2.17 Sections of piping or equipment removed from the system shall be flushed with water or other appropriate materials before performing other work on the piping or removed equipment.
- 4.2.18 Flanges must be cleaned and inspected for damage and/or deterioration prior to assembly. All gaskets in line breaks shall be replaced with new gaskets. Flange bolts shall be uniformly tightened using a crisscross pattern to minimize the potential for leakage. Flange bolts shall extend completely through their nuts.
- 4.2.19 Whenever line breaking or penetration work must be done from a manlift, and the line or vessel has contained a hazardous material with the capability of disabling the manlift operator in the basket, a qualified manlift operator must be stationed at the ground controls to bring the crew to ground level if such a disabling accident occurs.
- 4.3 Depressuring, Venting or Purging of Isolated Process Equipment Containing Flammable Materials
  - 4.3.1 Whenever process equipment is isolated for maintenance or service work, the equipment should be vented or depressured through flare systems when feasible.
    - 4.3.1.1 When a flare system is not available, the equipment should be depressured through bleed valves.
    - 4.3.1.2 Some process piping or vessels may not have bleed valves available for depressuring and may require breaking of flanges to depressure.
      - 4.3.1.2.1 When this is necessary, the flange should be carefully unbolted until the product begins to bleed from the system and then left until bled down.
      - 4.3.1.2.2 Operating personnel must ensure that hot work permits are not issued for other jobs that may be affected by the release of the flammable product. All drains and sewer openings must be covered or plugged to prevent the entry of flammable gases or liquids.
  - 4.3.2 Following depressurization of process equipment, the system shall be purged with appropriate gas/air to minimize the flammability of the product in the system prior to fully opening the piping or vessels. Air, Nitrogen (N) or Carbon Dioxide (CO<sub>2</sub>) can be utilized depending on how the systems are set up and the process involved.
    - 4.3.2.1 The air/gas shall be swept through the system in the same manner that the equipment was depressurized.
    - 4.3.2.2 Mechanical work may proceed when the product being released from the system has no known lower explosive limit (LEL) (0%), two feet from the venting or release point. A moderate flow of Nitrogen, air or CO<sub>2</sub>



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from the release point is necessary to assure an accurate sample is available for testing.

4.3.2.3 A hot work permit may be issued for impact wrenches or slugging wrenches when the LEL requirement (zero percent) is met.

4.3.2.4 Other hot work may proceed once the equipment is fully opened and the requirements of the Hot Work Permit Procedure are met.

4.3.2.5 If the above conditions cannot be achieved, the job must be reviewed by the Operating Authority and responsible maintenance supervisor.

## 4.4 Decommissioning of Process Lines or Equipment

### 4.4.1 Demolition Work

4.4.1.1 Establish ownership/responsibility for building, equipment, tanks, pipelines, etc.

4.4.1.2 Owner/responsible party shall;

4.4.1.2.1 Develop a site specific demolition plan and inform affected employees.

4.4.1.2.2 Verify that proper cleaning, purging and isolation have taken place.

4.4.1.2.3 Ensure JSA, Hot Work, Lockout/Tagout, Confined Space Entry, Line Breaking and Line Penetration procedures are followed as applicable.

4.4.1.2.4 Contact Environmental Department to assure all environmental requirements are met.

## 4.5 Recommissioning of Process Lines or Equipment

4.5.1 Initial preparation for placing lines or equipment back in service shall be performed by operations personnel responsible for the area. Existing low point drains and high point vents shall be closed.

4.5.2 Process lines or equipment that normally contain flammables, combustibles, toxics, or any product that is an environmental concern shall be pressure tested to insure system integrity prior to placing it back in service. The integrity test shall be accomplished by pressuring up the line or equipment with nitrogen to its normal operating pressure. When the normal operating pressure cannot be achieved due to plant nitrogen limitations, the line or equipment shall be pressured to the maximum nitrogen header pressure.



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4.5.3 Upon achieving the required pressure the nitrogen valve shall be closed. Operations shall monitor the leak down rate to determine the integrity of the system. Once the line or equipment has been determined to be intact the system can be returned to normal service.

4.5.4 The requirement for integrity testing may be waived by the Supervisory Authority or Plant Engineer.

## 5.0 ATTACHMENTS

Not Applicable

## 6.0 REFERENCES

- 6.1 29 CFR 1910.147 - Control of Hazardous Energy Sources
- 6.2 29 CFR 1910.119 - Process Safety Management of Highly Hazardous Chemicals
- 6.3 DFS Risk Management Plan
- 6.4 DFS Clearance Program
- 6.5 DFS Hot Work Program
- 6.6 DFS Pre-Job Site Inspections and Job Safety Analysis Program
- 6.7 DFS Energy Verification and Control Program








# 00-SP-032 Line Breaking and Line Penetration Procedure (B)

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