

Line Breaking

N-ID-OSA 015

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regular = BASF requirement

Italics – regulatory

box – recommendation

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1 Reference to Superior Document

References in superior documents exist in global requirement document [G-R-OSA 001](#): *Occupational Safety*, Sections 4.4: *Work Permit*, 9: *Activities with Life-Threatening Hazards and Potential for Irreversible Damage*, and North America requirement document [N-R-OSA 001](#): *Occupational Safety*, Section 1.7.5: *Line Breaking*.

2 Purpose

The purpose of this document is to establish minimum standard work practices and procedures for initial safe opening and ensuring work on flanges, pipes, and equipment that contained or may have contained hazardous material, thermal hazards (hot or cold), or has been under pressure.

3 Definitions

4-Eyes Principle

the use of two (2) or more individuals (equipment operator/owner and individual(s) performing the work) to assess tasks to ensure identification of all hazards and elimination or control of them through safe work practices, use of PPE, communication and awareness, etc.

contracted employee

an individual or group of individuals for whom BASF provides direct supervision in day-to-day activities and direction as to how to perform an activity

contractor

an individual engaged by or through a third party to perform services principally for the third party

hazardous material / energy source

any electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy (e.g., radiation), including stored or residual energy, that, if unexpectedly or inadvertently released, could cause injury to personnel, or if introduced into a process, pose a risk:

- health, physical, or environmental hazard
- cryogenic
- high temperature (greater than 120° F)
- pressure

learning objective

specific knowledge, skills, or attitudes the training participant is intended to learn at the end of the training program; at a minimum, will include applicable regulatory training elements

line breaking

the actual opening/separation/removal of equipment containing or having previously contained a hazardous material / energy source; includes but is not limited to all types of flanges, pumps, manways / hatches, screwed pipe, fittings, exchanger tube plugs, valves, tubing, hoses, sanitary connections, or other types of connections / openings in process or utility service

operating / owning department

the unit or department that operates or is responsible for the daily operation of the process, area, or facility where work is in progress

permit acceptor

person responsible for obtaining approval to do work

permit issuer

personnel who have been trained, qualified, and authorized to issue permits on behalf of the operating / owning department

written operating procedure

a document that describes the chronological steps necessary to complete a job including safety and quality considerations for each step

4 General Requirements and Activities

4.1 Written Program

Each site shall establish written standard practices governing the conduct of line breaking and the written authorization for line breaking activities (i.e., permit process that addresses line breaking activities). The written practices shall include applicable line breaking precautions including but not limited to

- site-specific scope and application
- program review
- defined roles and responsibilities
- authorization of activities
- line breaking preparation and pre-work
- communication with and among contractors and departments
- termination of activities
- PPE
- recordkeeping
- training and qualification

See Section 5.3, Attachments ; Site Written Procedure Template.

4.2 Program Review

Each site shall review the effectiveness of line breaking practices at least annually to ensure that the management system is properly implemented and that the elements adequately control line breaking activities. At a minimum, include the following management system elements in the review:

- a comparison of the site procedure and the site permit to the corporate procedure and the corporate permit requirements
- a review of incident reports involving line breaking activities that have occurred since the last annual management system review
- inspection of at least one (1) line breaking job in progress to ensure that all applicable precautions were indicated on the permit and implemented in the field
- interviews with permit issuers, persons performing line breaking, and other affected employees including contractor and contracted employees where applicable

- a review of applicable testing equipment/instrument maintenance and calibration records

The results of the program review shall be documented and included as part of the site Responsible Care® Management System (RCMS®) review process.

See [Section 5.3, Attachments](#); Line Breaking Management Review Checklist.

4.3 Line Breaking Permit Activities

4.3.1 Line Breaking Authorization

No personnel, including operating / owning department personnel, shall perform a line break without the prior written authorization in the form of a permit issued that a permit issuer has dispensed. The permit issuer must be a different person from the permit acceptor performing the line breaking activity. Determine additional measures (per the site written program) depending upon the type of hazard.

Examples include requirements to:

- use the 4-eyes principle and sign for the hazard review and necessary precautions
- only allow specially qualified personnel to review the work and authorize the permit, (e.g., supervision, manager, team leader, subject matter expert)
- require a special permit, additional checklist, or additional authorization
- implement measures for personnel working alone

Lines or equipment that have been previously opened under line breaking and then subsequently closed shall be treated as a new line breaking activity before lines or equipment can be re-opened. All requirements of a new line breaking activity are applicable. This requirement also applies to lines and equipment that have not been returned to service.

4.3.2 Line Breaking Permit

See [Section 5.2, References, N-ID-OSA 024: Safe Work](#), Sections 4.3, 4.4, and 4.5, for detailed requirements relative to permit issuance, content, format, and use.

Permit Exemption – Trained operating / owning department personnel may perform routine activities (e.g., filter or strainer cleaning, hose connection or disconnection, vessel inspections for level gauging, and process sampling) without a permit if they use current written operating procedures that cover the identification and control of hazards. The work must be performed using measures that provide protection equal to safeguards stated in this section.

4.3.3 Line Breaking Preparation and Pre-Work

Before performing any line breaking, the permit issuer and an individual who will perform the line breaking shall verify in the field that the following items have been completed or are in place per the 4-eyes principle. The permit issuer shall document field verification of all required pre-work on the permit. Operating / owning department personnel authorizing line breaking shall verify the following:

- All affected lines or equipment have been emptied, purged, flushed, drained, vented, isolated (including flow and pressure), and tagged as applicable to ensure that the system is free of hazardous material / energy sources.
- Process or equipment is assessed for the potential to trap or contain hazards at various locations when line breaking occurs at several points within a system.
- The line breaking permit, when and where applicable, has been completed and signed (by the permit issuer and the permit acceptor) and a copy maintained at the work area.
- All other applicable permits such as lock, tag & try, confined space entry, hot work, and safe work are properly completed, in use, and maintained in the work area.
- De-pressurization of the lines or equipment and absence of material has been accomplished, when possible, by opening vents and drains. Where present, check pressure gauges for pressure readings. Open and clear bleeds.

NOTE: Opening of a bleed / drain valve does not constitute line breaking.

- Perform testing using a properly calibrated direct reading instrument or indicator on lines or equipment that may have contained flammable and / or toxic liquids or gases before and intermittently during the line breaking activities as appropriate for the operations. State testing parameters on the permit or in the written operating procedure.
- Restrict access using barricades and barrier tape when work is elevated or over grated platforms. Use splash or drain pans as needed to protect personnel and equipment below the work area.
- Fully inform personnel performing the work of any potential hazards, special safety precautions, and the location of the nearest safety shower / eye wash equipment.
- All groups involved in or potentially affected by line breaking activities communicate appropriately to assure the coordination of activities.
- Clearly define the level and type of PPE for the various line breaking tasks. Make PPE available at the job location, and communicate this to personnel performing the work.
 - the use of required PPE until the initial opening has been completed and until the atmosphere can be verified free of hazardous material / energy sources
- The written operating procedure or job plan includes:
 - the use of defensive positioning to avoid a spray or release when attempting a line break
 - breaking of flanges on the opposite side of the piping from personnel

4.3.4 Termination of Pre-Work and PPE Requirements

All applicable pre-work and PPE requirements shall remain in effect until verification is positive that hazardous material / energy sources are no longer present or are controlled to the extent that they no longer pose a hazard to personnel. Verify after line breaking (e.g., creating an air gap separation between

the flanges) is completed, through one or more of the following methods as applicable, by operating / owning department personnel:

- testing (i.e., neutral pH of flush water)
- purging through an open drain / bleed valve adjacent to the line break
- atmospheric monitoring for flammable and / or toxic gas or vapor
- monitoring for respirable atmosphere when working on lines containing asphyxiates
- other methods approved by the site appropriate for the hazardous material / energy sources

Verification shall be documented on the permit.

4.3.5 Termination of Line Breaking Permit

Return all permits to the permit issuer following the permit duration or at the completion of the work, whichever occurs first.

Individual(s) performing the work or a representative of the individual(s) performing the work and a permit issuer shall terminate the permit.

4.4 Personal Protective Equipment (PPE)

4.4.1 Hazard Assessment

The appropriate type of PPE employed in each line breaking situation will vary depending upon the hazards associated with the material, equipment, location, and ability to verify that the equipment/line is clear. Personnel must use site practices that follow [N-ID-OSA 007: Personal Protective Equipment](#) to determine appropriate PPE.

4.4.2 Minimum PPE Protection

The minimum protective equipment in any line breaking situation shall be:

- *chemical, thermal and/or other appropriately protective gloves per the site's PPE hazard assessment*
- *full-face protection (face shield or full-faced respirator) if potential exists for splashing, spraying, or dripping onto the face*
- *chemical goggles required for eye irritants*

In addition to the minimum protection stated above, protection for line breaking involving equipment that contains or previously contained corrosives, skin absorbable materials, sensitizers, or materials that could pose a significant thermal hazard shall be:

- *chemical goggles and face shield (unless wearing a full faced respirator, fully encapsulating suit, hood or other PPE that provides equivalent protection).*
- *chemical- / thermal-resistant boots*
- *appropriate type of chemical- / thermal-resistant clothing that is specifically protective for the chemical of potential exposure*
- *When activities have the potential to drip, spray, or pour downward onto individuals performing the work, additional measures may include the taping of*

glove / clothing openings, use of hooded clothing, or other measures to ensure that materials do not come into contact with the skin.

PPE may not be downgraded until line breaking activities have been properly terminated per [Section 4.3.4](#).

4.4.3 Respiratory Protection

Where a potential for inhalation exposure exists, select respiratory protection and follow practices as provided in the site Respiratory Protection Program and the site PPE Hazard Assessment.

4.5 Training

4.5.1 Personnel Involved in Line Breaking Activities

- Operating/Owning Department and service/maintenance personnel shall receive training to recognize the applicability of Line Breaking situations and the necessary means to safeguard against the hazards posed during these activities.
- Conduct training during employee orientation and periodically thereafter, at least every third year, according to the EHS Curriculum Assignment Process.
- Retraining of employees is required whenever deviations or inadequacies in any procedure are identified.
- Provide training about the facility emergency action plan.
- Regarding training about PPE, see Section 5.2, *References*, [N-ID-OSA 007: Personal Protective Equipment](#).

4.5.2 Personnel Not Directly Involved in Line Breaking Activities

- Personnel not directly involved in line breaking activities will receive instruction concerning their roles in the procedure and how line breaking activities may affect their specific work operations.
- Training will be conducted during employee orientation and periodically thereafter, at least every third year, according to the EHS Curriculum Assignment Process.

4.5.3 Documentation

Document all training, including the following:

- each trainee's name
- date(s) of attendance
- means used to verify understanding
- learning objective(s) for the course(s)

See Section 5.2, *References*, [BC037: Record Retention Policy](#), and the applicable record retention schedule.

4.5.4 Contractor Employees

See Section 5.2, *References*, [N-ID-OSA 002: Contractor EHS Management](#), for requirements.

5 Supplement

5.1 Revision History

Effective Date	Revision	Section	Short Description of Changes
09/14/2017	0	all	initial release

5.2 References

- [N-ID-OSA 002](#) *Contractor EHS Management*
- [N-ID-OSA 007](#) *Personal Protective Equipment*
- [N-ID-OSA 024](#) *Safe Work*
- [BC037](#) *Records Retention Policy*
- [G-R-OSA 001](#) *Occupational Safety*
- [N-R-OSA 001](#) *Occupational Safety*

5.3 Attachments

- [site written procedure template](#)
- [line breaking management review checklist](#)

5.4 Abbreviations

- PPE** personal protective equipment
- RCMS[®]** Responsible Care[®] Management System