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1. Purpose

1.1. The purpose of this policy is to define Gallant Industrial approach to First Line Break activities.

2. Scope

2.1. This procedure applies to any Gallant Industrial work involving the opening of process lines, equipment, or systems at refineries, gas processing plants, power plants or other processes that involve the potential release of hazardous materials.

3. Roles and Responsibilities

3.1. Construction Managers / Project Managers / Site Managers / and Gallant Site Leadership

3.1.1. Understand and comply with the requirements outlined in this policy.
3.1.2. Ensure the requirements of this policy are fully implemented and adhered to.

3.2. Superintendents / General Foremen / Foreman

3.2.1. Understand and comply with the requirements outlined in this policy.
3.2.2. Ensure the requirements of this policy are fully implemented and adhered to.
3.2.3. Provide necessary interaction as required by this policy.

3.3. Site Safety

3.3.1. Supports site leadership as needed to ensure the requirements of this policy are being met.

3.4. Front Line Employee (Affected Person)

3.4.1. Verifies and ensures all work permitting, risk assessment and hazardous energy mitigation steps are followed to complete the work safely.
3.4.2. Stages materials needed for the FLB including but not limited to barricades, bolts, and required PPE.
3.4.3. Calls the Authorized Person and does not perform FLB until the Authorized Person signs the FLB tag(s) and is present prior to the FLB.
3.4.4. Removes tag and returns to the Authorized person along with the permit at the completion of the FLB.

4. General Requirements

4.1. PLANNING AND PROCEDURE DEVELOPMENT

4.1.1. Generally, plant operations personnel clear and depressurize the equipment or system which is to be opened. Gallant Industrial personnel may or may not be directly involved in this process but must completely understand the status of the line, vessel or system before line breaking/opening the system.

4.2. General Isolation and System Evaluation Requirements

4.2.1. These elements must be completed.
4.2.1.1. Identify the contents, pressure, and service of the line, vessel, or system to be opened.
4.2.1.2. Determine the procedure for system shutdown, depressurization, draining, purging and isolation. (The possibilities of toxic gases backing through purge and vent connections or through connecting lines into equipment that is normally free of such gases must be considered in the purging, line breaking and blinding activities.)
4.2.1.3. Determine Lockout/tagout procedure.
4.2.1.4. Determine spill containment methods to be used in the event of a spill or release.
4.2.1.5. Determine required personal protective equipment.
- If a reduction in protective equipment is required to facilitate the working conditions, the minimum PPE and the point in the operation that the level of protection may be reduced must be specified.
- In circumstances involving highly hazardous chemicals (hyperlinked section 6.3), the full personal protective equipment (as prescribed by the SDS) will be required to be worn until the completion of the job, unless the following conditions are met to ensure positive system isolation.

- This system is isolated via double block and bleed and proven clean and clear.
- The system is blinded with pressure rated blinds and proven clean and clear.

4.2.1.6. Determine required gas monitoring equipment.
4.2.1.7. Determine the method(s) for verification of depressurization.
4.2.1.8. Choosing proper personal protective equipment.

- PPE will be selected, prescribed, and utilized based on the status of the isolation, the system condition, and the contents of the system.
- The SDS for the contents of the system will be required to be available at the work location with the job packet, risk assessment, permit, etc.

4.3. First Line Break Checklist Requirements

4.3.1. The Gallant First Line Break Checklist is required for all First Line Break activities.
4.3.2. All question below must be answered "yes" or "NA" to proceed without site management approval.

- Has job walk down with operations been completed?
- Have equipment isolation points been identified?
- Is blind list verified and on location?
- Has the "Try" step been performed by operations and witnessed by all involved personnel?
- Have "traps" been evaluated (low point breaks, back pressure, cycling systems)?
- Have Line Openings been verified to be within the system isolation and line break location marked?
- Have all pre-task Hazard Analysis been performed as required?
- Does this line break involve a flare line opening?

Note that this checklist does not apply to Flare Line Breaks. Any linebreak involved with the flare must adhere to the GALLANT Flare Line Opening Policy/Procedure and related paperwork.

- Have isolation methods been verified to be in place (keys, tags, lockbox, lists, etc.)?
- Has the crew obtained a permit to perform work on the system?
- Has Operations completed their portion of the approval process (Permit) to perform the work?
- Has Gallant personnel completed their portion of the acceptance process (Permit)?
- Have all necessary signatures been obtained by Operations?
- Have all necessary signatures been obtained by Gallant employees?
- Is there a minimum of one mechanical craftsman assigned to perform First Line break?
- Has proper PPE been determined based on contents and Gallant / client procedure?
- Is barricade sufficient for Line Opening? (i.e. Dropped Object / Splash / Downwind)
- Has work platform been evaluated to ensure employees can open line "down and away"?
- Is adequate containment in place to capture any spill/leaks that may occur during line break?
- Are all non-essential personnel positioned upwind from the Line Break (Bottle watch, etc.)?
- Cold Cut -Are the Gallant Cut Line Policy/Procedures in place?
- Cold Cut -Has equipment contents been checked to ensure LEL at or below 10ppm?

4.4. LINE-BREAKING AND BLIND INSTALLATION WORK PROCEDURE (Not all First Line Breaks will require blinding, in those scenarios only the line breaking steps apply.)

4.4.1. Supervisor communicates the information and procedures of Section 4.2 to the craft supervisor and crew.
4.4.2. Identify and mark or tag the flanges to be opened and blinded.
4.4.3. Verify flange size and pressure by visual examination of the information stamped on the flange.
4.4.4. Verify blind thickness required by checking a blind pressure rating chart. See Appendix C of this procedure.
4.4.5. Verify gasket size and type.
4.4.6. If new studs are being used, verify diameter, length, number required and type.
4.4.7. Establish safe access to the flange, i.e., scaffolding, aerial platform, and fall arrest system.
4.4.8. Obtain safe equipment (rope, come-a-long, chain fall, and crane) for lifting and placing the blind or for swinging a spectacle blind as needed.
4.4.9. Obtain operator approval to start the line breaking process. (Work permit).
4.4.10. Verify Lockout/Tagout.

4.4.11. Don appropriate personal protective equipment.
4.4.12. Verify depressurization. Pressure gauges alone should not be relied upon to indicate lack of pressure. Depressurization should be confirmed with an open vent or drain using a wire, rod, or reamer inserted in the vent or drain to confirm that it is not plugged. Appropriate PPE must be worn for this process. Vents are not to be considered the final source of verification if drains are present. If a drain is plugged, then all efforts to unplug the drain should be made so depressurization verification can be determined. If verification cannot be made, then craftsmen shall use flange straps to divert potentially pressurized product away from craftsmen once gasket seal is broken.
4.4.13. Actual Line breaking and blinding work sequence.
4.4.14. It is to be assumed that the line is under pressure and that toxic or flammable substances are present during this process unless demonstrated otherwise and witnessed by Gallant.
4.4.15. Personal protective equipment must remain in place until it is absolutely certain that the line or vessel is clear. Initial breaking of the flange may indicate that the line is clear, but a delayed release can occur if a vacuum or vapor lock lets go or if an isolation valve leaks or fails.
    4.4.15.1. Absolute minimum PPE for Line breaking activities is plant standard PPE, gloves appropriate to the type of work, and a face shield with safety glasses.
4.4.16. To maintain the ability to exercise control over leakage from flanges involved in blinding, it is important to remove no more bolts than is necessary for access to clean the flange faces and install the gaskets and install or remove the blind. A minimum of 2 bolts should be left tight until ready to open the flange, and then these bolts should be loosened and without completely removing the nuts the flanges can be spread to install or remove the blinds. The flange should always be opened on the side away from the craftsman so that any sudden release will be directed away.
4.4.17. Bonding clamps may be required across flanges to be opened, under some circumstances, to avoid sparking.

4.5. Work sequence

4.5.1. Loosen the bolts on the opposite side of the line where you are standing. (always break down and away from your person.)
4.5.2. Keep nuts close to the flange so they can be quickly retightened in case of a release.
4.5.3. Loosen remaining studs.
4.5.4. Use a non-sparking wedge to open the line to determine if the line is clear.
4.5.5. Remove a sufficient number of studs to allow the blind to be inserted.
4.5.6. Spread the flange with wedges or flange splitter, if necessary.
4.5.7. Remove old gasket and clean flange faces if required.
4.5.8. Insert blind using the planned procedure.
4.5.9. Insert new gasket on both sides of blind.
4.5.10. Tighten studs in the proper sequence. See Appendix B of this procedure.
4.5.11. Reduce personal protective equipment to the level for routine operations.
4.5.12. Remove appropriate blind tag information and give to person responsible for blinding records or tag board.

4.6. Blind Removal Procedure

4.6.1. Pressure and liquid or gas release must also be assumed during line breaking to remove blinds. Other systems may have remained in operation or have been returned to operation.
4.6.2. Obtain operator approval to remove the blind, ensure this is on the permit to work.
4.6.3. Verify gasket and stud requirements.
4.6.4. Establish safe access to the flange.
4.6.5. Use the same work sequence as used for the blind installation.
4.6.6. Remove appropriate blind tag information and give to person responsible for blinding records or tag board.

5. Definitions

5.1. **Blinding -** is the process of installing or removing a blind.
5.2. **Blind Flange** - means a solid flange plate of appropriate size and rating used to close off the end of pipe, fitting, valve or opening on equipment by bolting to a matching flange.
5.3. **Blind List -** A document giving information for each blind such as the specific location, size, series, type of gasket, time of installation and removal, and providing space for authorization signatures and indication of blind status.

5.4. **Flange Faces -** Flanges are manufactured with a variety of face types including raised face, flat face, lap joint, ring joint and tongue and groove.

5.5. **First Line break** – the initial opening of a process system. This includes, opening of flanges, separating threaded connections, uncoupling piping systems, removing vessel covers/doors, or any other initial opening of a process system.

5.6. **Plugs** - are used to plug small threaded connections and may be considered running blinds.

5.7. **Slip Blind or Pancake Blinds** - are used to prevent flow by installing a gasket on each side of the blind between two flanges.

5.8. **Spectacle Blind or Figure Eight Blinds** - get their name from their similarity to a pair of eyeglasses or spectacles. One side of the spectacle blind is fully closed, and the other side is open for full flow. By being constructed in this fashion, the blind can be rotated from open to closed position without removal from the flange.

5.9. **System Blinds** - are used when process equipment is shut down for inspection, cleaning, or repairs to isolate the equipment or system to protect both personnel and the system. System blinds are normally "in" when the system is down and "out" when the system is operating.

5.10. **Tag or Blind Tags -** Tags are used to mark the locations of the flanges to be opened or blinded, to indicate the presence or absence of an isolation blind and, in some cases, to indicate the status of the isolation blinding procedure.

6. Forms and References

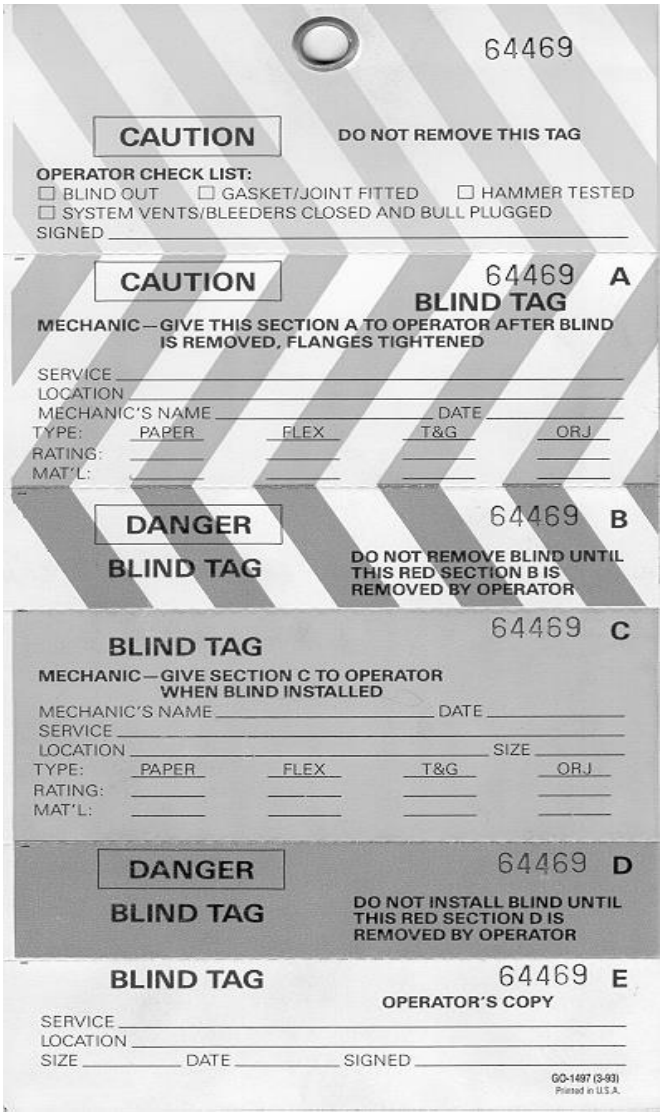
6.1. 29 CFR 1910.119 Process Safety Management

6.2. 29 CFR 1910.147 Lockout/Tagout

6.3. 29 CFR 1910. App A - List of Highly Hazardous Chemicals, Toxics and Reactives (Mandatory)

Appendix A (Example Blind Tag)

The complete tag is attached to each blind point. The blind tag outlines the sequence of actions from E to A, and the tags provide information about the blind. A section of the blind tag is removed to authorize work. For example, a blind cannot be installed until Section D is removed from the tag and a blind cannot be taken out until Section B is removed from the tag. The tag system is also a report of work completed. As work is completed, the appropriate tag is returned to the master blind list file, and the blind report is updated. The operator that hangs the tag signs Section E and the operator check list and the mechanic/boilermaker that installs or removes the blind signs Section C and A...
This is an example tag. Tags will be project specific.



APPENDIX B

Stud Tightening Procedure.
It is important that all bolted joints be tightened uniformly and in a diametrically staggered pattern except for special extra high-pressure closures when the instructions of the manufacturer should be followed.

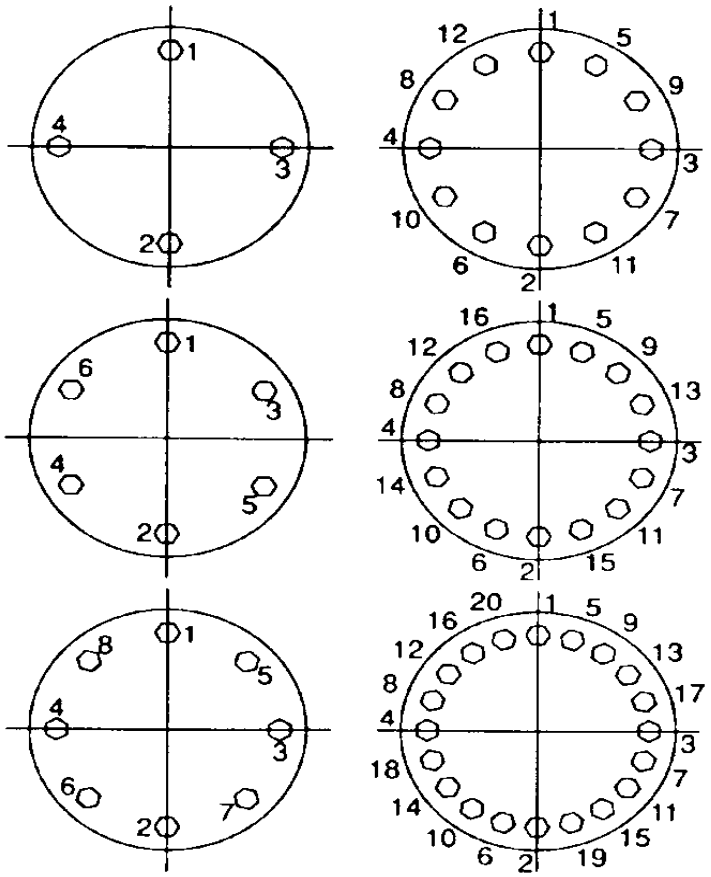


Illustration 1 Note: Numbers indicate tightening sequence.
The bolt pattern indicated in Illustration 1 is one of the primary suggested methods of bolting high pressure flanges. The methods used by most people on low pressure joints are shown in illustration #2.

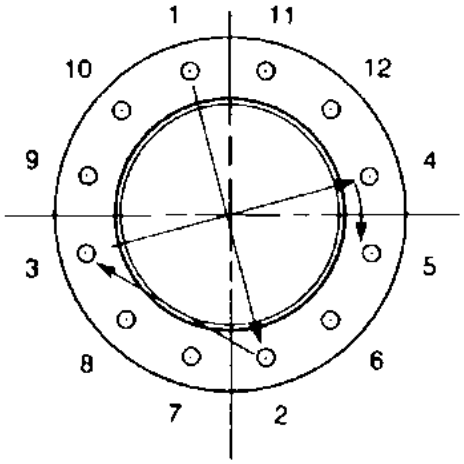


Illustration 2

For either method, start at the widest gap between the flanges (stud #1), tighten lightly until flanges touch gasket and then go to stud # 2 and tighten. At this point the flanges should be parallel, and the gaskets should not be pinched. Now proceed to stud #3, tighten it lightly, and then tighten stud #4. The remainder of the bolting pattern should now be followed.

In the method indicated in illustration #1, the sequence required is to follow the stud numbers, whereas the other method of illustration #2 only requires stud #'s 1, 2, 3 and 4 to be followed in sequence, then the tightening procedure is to merely go around the flange, stud to stud.

Go around as many times as necessary to sufficiently tighten all studs. At least two threads on the studs should project out from the nuts.

Care should be taken to avoid overtightening joints. Studs stretched beyond the allowable limits are difficult to remove and should not be reused.

APPENDIX C

The following blind size chart is provided as general information. All blind dimensions and thickness must be verified by the engineering department.

RAISED FACE or FLAT FACE in INCHES													
Line Size	ID	125 /150 #		250 / 300 #		400 #		600 #		900 #		1500 #	
		OD	TK"	OD	TK"	OD	TK"	OD	TK"	OD	TK"	OD	TK"
1	1 1/8	2 ½	¼	2 ¾	¼	2 ¾	¼	2 ¾	¼	3	¼	3	5/16
1 ½	1 ¾	3 ¼	¼	3 5/8	¼	3 5/8	¼	3 5/8	¼	3 ¾	5/16	3 ¾	3/8
2	2 ¼	4	¼	4 ¼	¼	4 ¼	¼	4 ¼	5/16	5 ½	3/8	5 ½	½
3	3 ¼	5 ¼	¼	5 ¾	3/8	5 ¾	3/8	5 ¾	7/16	6 ½	9/16	6 ¾	11/16
4	4 ¼	6 ¾	¼	7	½	6 7/8	½	7 ½	9/16	8	11/16	8 1/8	7/8
6	6 ¼	8 5/8	3/8	9 ¾	5/8	9 5/8	5/8	10 3/8	13/16	11 ¾	1	11	1 7/16
8	8 ¼	10 7/8	½	12	¾	11 7/8	7/8	12 ½	1 1/16	14	1 5/16	13 3/4	1 11/16
10	10 ¼	13 ¼	5/8	14 1/8	1	14	1 1/16	15 5/8	1 3/16	17	1 5/8	17	**
12	12 ¼	16	¾	16 ½	1 1/8	16 3/8	1 ¼	17 7/8	1 9/16	19 ½	1 15/16	20 3/8	**
14	14	17 ½	¾	19	1 ¼	18 7/8	1 7/16	19 ¼	1 3/4	20 3/8	**		
16	16	20	7/8	21 1/8	1 3/8	21	1 5/8	22 1/8	**	22 ½	**		
18	18	21 ½	1	23 3/8	1 9/16	23 ¼	1 13/16	24	**	25	**		
20	20	23 ¾	1 1/16	25 5/8	1 ¾	25 3/8	**	26 ¾	**	27 3/8	**		
24	24	28 1/8	1 5/16	30 3/8	**	30 1/8	**	31	**	32 7/8	**		

Note: Thickness shown above is for ASTM 285 Gr. C and/or 516-70 steel.

** Thickness not shown is dependent upon type of material selected