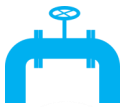
Opening Process Piping & Equipment
Field Reference Tool

Exclusions

Equipment exempt from this Procedure includes drilling, completion, flowback, workover, fresh water lines, atmospheric storage tanks (only when tank gauging from the tank hatch), and routine maintenance and operation of equipment that is designed to be periodically opened (e.g. sumps, strainers, dump valves, and pig launchers and receivers).

Hazards of Opening Process Piping and Equipment

Assess risks associated with the hazards of opening process piping and equipment prior to the start of the work activity using a **Job Safety Analysis (JSA)** or **Pre-Job Safety Meeting (PJSM)**.

	• Physical hazards due to release of pressurized material, exposure to corrosive materials, or temperature extremes • Dropped objects from unsecured piping
	• Fires or explosion due to hydrocarbons, other flammable materials, or the introduction of oxygen into closed hydrocarbon process systems • Exothermic reactions due to pyrophoric scale
	• Toxicity due to benzene, methanol, hydrogen sulfide or other chemicals • Asphyxiation due to nitrogen or inert gases used for purging or displacement of oxygen • Dizziness or nausea due to exposure to hydrocarbons
	• Environmental impacts due to spills or venting

Breaking Containment

Do **NOT** use plastic buckets or containers

Use metal buckets **WITHOUT** plastic handles or liners

A bonding cable with clamps is the preferred method of bonding the dispensing vessel to the receiving vessel or container

If cutting pipe, ensure a "cold cut" technique is used for the initial cut so that it does not pose the risk of ignition when hydrocarbon equipment and piping systems are to be cut. Additional cuts are cold cuts until it is verified that there are no remaining hydrocarbons present.

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Is the process piping being opened GREATER than 2 inches in diameter?

Yes

No

Not required to be drained. Make every attempt to depressurize prior to breaking containment.

Use a 4-gas monitor to evaluate the breathing zone while working on the open process piping or equipment.

Is it possible to conduct atmospheric monitoring with pump type 4-gas monitor near an access point such as a flange, bleed point, or other process opening?

Yes

No

Are the readings BELOW ALL of the following thresholds?

- 10% Lower Explosive Limit (LEL)
- 10 ppm H2S
- Occupational limits listed in the RP Respiratory Protection Procedure (or Field Reference Tool)

Yes

No

Remove hazardous vapors and gases by venting, flushing, inert gas purging, or use of degassing chemicals when the LEL is 10% or greater

Is the Lower Explosive Limit (LEL) still 10% or higher?

Yes

No

Is the atmosphere within the piping or equipment still ABOVE the following thresholds after venting, flushing, purging, or degassing?

- 10 ppm H2S
- Occupational limits listed in the RP Respiratory Protection Procedure (or Field Reference Tool)

Yes

No

Proceed with depressurizing and opening the piping or equipment.

Ensure the atmosphere is monitored using a pump 4-gas monitor for LEL and H2S after opening until the area is confirmed to be free from hazards.

Breathing air is not required for this task.

Proceed with depressurizing and opening the piping or equipment.

- Spark producing ignition sources must be 50 feet or greater from the location of the planned process break or venting operation
- Non-spark producing ignition sources must be 10 feet or greater from the location of the planned process break or venting operation

- Obtain Supervisor approval prior to implementing mitigating measures when the LEL cannot be reduced below 10% and the ignition source distances requirements cannot be satisfied
- Conduct a JSA or PJSM to address the specific mitigations associated with the ignition source prior to breaking containment. Document Supervisor approval on the JSA or PJSM

- Ensure personnel with potential exposure utilize breathing air (or any other approved respiratory protection as indicated in the Respiratory Protection Field Reference Tool) prior to the opening of piping and equipment, and at all times during the task until the atmospheric readings are below the thresholds

  Note: A stand-by person is required for IDLH or unknown atmospheres

- Verify personnel performing the process break have unimpeded means of egress in the event of an emergency

Take the following precautions when venting vapors:

- Establish a regulated area
- Vent the vapors within the established regulated area
- Ensure no unauthorized personnel are within the regulated area