



# PROCESS ISOLATIONS: SAPREF

# BACKGROUND

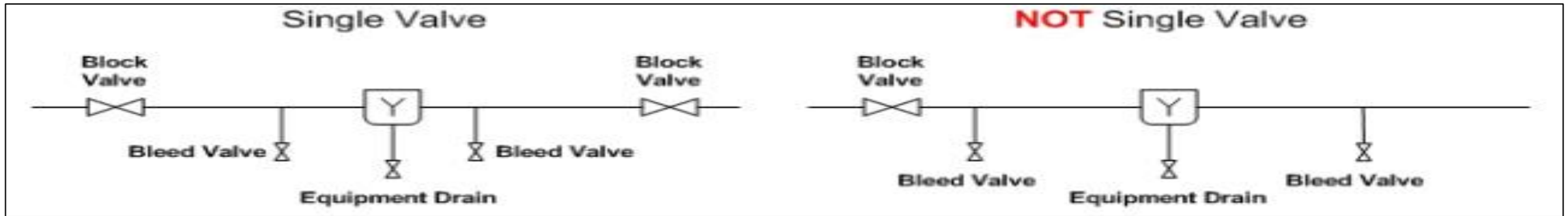


Unexpected release of process equipment energy during opening to isolate equipment for repair has resulted in deaths and serious injuries in industry. Opening process equipment, which has been under pressure, involves a major HSE risk that is required to be reduced to ALARP and meet applicable tolerability requirements.

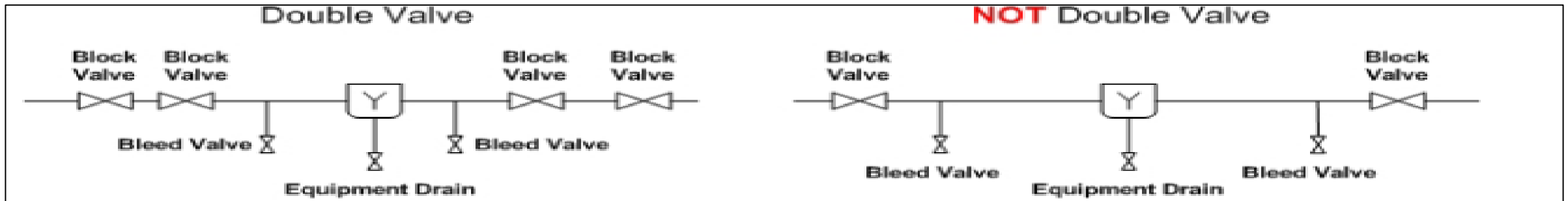
# TYPES OF ISOLATION

Isolation method hierarchy order (from least stringent to most stringent):

- a. **Single Valve** - Single block valve isolation is when one block valve is providing isolation between the line opening and the process. When a single valve is used, there needs to be a way to reduce pressure to atmospheric or as near atmospheric as possible, such as the use of a bleeder.

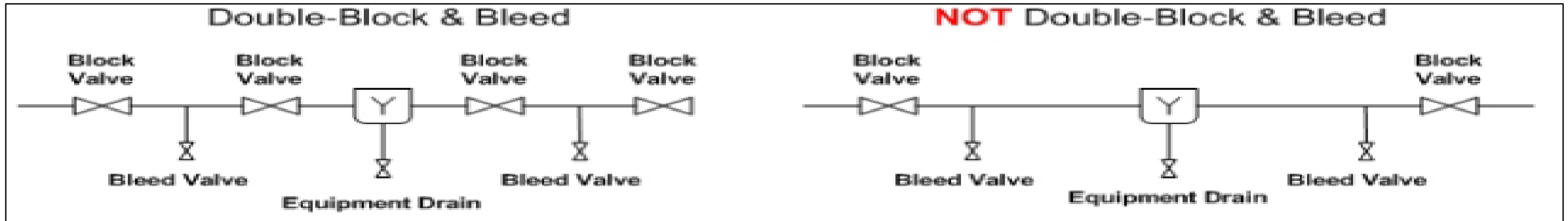


- b. **Double Valve** - Double block valve isolation is when two block valves are providing isolation between the line opening and the process. When a double valve is used, there needs to also be a way to reduce pressure to atmospheric or as near atmospheric as possible, such as the use of a bleeder.



# TYPES OF ISOLATION CONTINUED...

- c. **Double-Block and Bleed** - Double-block & bleed isolation is the same as a Double Valve isolation except that a bleeder is located between the two isolation valves. The bleeder is used to verify that the first valve is holding making the second valve the redundant safety block.



- d. **Single Valve, Bleed and Blind or Air Gap** - Air Gap is when the piping/equipment has been disconnected and a section removed or separated eliminating the possibility of material being pressured or pulled into the equipment being worked. Generally, the open ends are secured with blinds/spades/plugs or other mechanical means. The work (pressure) side of the air gap needs to be controlled through the site process isolation control methods.

Valves that are NOT to be used as isolation valves for hazardous energy are:

- Check valves,
- Control valves,
- Globe valves, or
- Pressure Relief Valves.

# ISOLATION METHODS

Isolation Methods Order of Hierarchy (from most stringent to least stringent)

1. **First** – Eliminate the need to open the process. (E.g. schedule the opening during a planned unit shutdown.)
2. **Second** – Use blinds or spades or air gap to isolate the process
3. **Third** – Use double block valves with controlled bleeder valve to monitor the integrity of the isolation valves. The valves are to be tagged or be chain locked and the key controlled by the personnel doing the work and being protected by the isolation methods.
4. **Fourth** – Use a single block valve to control potential unexpected loss of containment.

# ISOLATION METHODS CONTINUED....

## **Use of Chains or Tags to Lock Valves used for Isolation Methods:**

Valves that are used for isolation, must be secured using either a locking method or a tagging method. The intent of this recommended practice is that valves, that do not remain under the exclusive control of a person who is performing the work, will be secured with a locking device such as a chain and lock.

For example, to install a blind, a valve is closed, and that valve could be safeguarded by a tag and a worker who signs the tag and takes custody of the valve while they are doing the process isolation and who stays within the immediate area during the process opening. If the valve is used as the only isolation device and will be left unattended, then a chain and lock control system would be used to secure the valve.

## **Process Isolation to Protect Personnel performing Confined Space and Hot Work:**

All confined space entry and/or all hot work is to be isolated by blinds/spades or physical disconnect at the closest flange to the vessel or work area as practical.

# ISOLATION METHODS CONTINUED....

## **Spading/De-spading and Blanking of Lines & Equipment:**

Spading or blanking means the positive isolation from any source of energy arising from the storage and transmission of fluids.

Before a Spade is installed, the equipment is always depressurized and, in some cases, purged and steamed out. However, the equipment or line being worked on must be treated as though it contains some form of energy.

Spades/ Blanks are installed for:

- a) Positive isolation
- b) Pressure tests
- c) Process separation (running blind)

Types of Spades:

- a) Spectacle blinds – part of the line design
- b) Normal spades – installed to positively isolate pressure systems.
- c) Slip spades – a thin spade which can only be used when it is certain that the spade will not be subjected to system pressures or hydro test pressures.
- d) Blank flanges – flat plates sized and drilled according to the line class or vessel flange specifications and fitted at the open ends of pipelines, valves or nozzles

# ISOLATION PACKAGE

1. Operations should develop and maintain an isolation package for most pieces of process equipment and isolation jobs. The isolation package includes:
  - a. A drawing or sketch marked with the valve isolation points, isolation test points (i.e. bleeders, pressure gauges, etc.), valves used for blinding, and blind points,
  - b. A written list identifying all the valve isolation points, isolation test points (i.e. bleeders, pressure gauges, etc.), valves used for blinding, and blind points, and
  - c. The isolation method being used.
  
2. Information included in the permit to work includes:
  - a. Necessary PPE to do the job,
  - b. The emergency information is to be provided for all process isolation work as part of the normal permitting process or a job specific plan
  - c. Process equipment access information, the work area is to have an access and egress route that can be used in the event of an unexpected release
  
3. An isolation package is considered active from the time the first permit is written against the package until the last permit has been completed. Active isolation packages are to be kept in a location accessible to all operating shifts and maintenance crews (i.e. control center, Operator shelter, etc.). Completed Isolation Packages are to be filed with the Permit to Work and retained by Operations.