

3 Things to Avoid When Installing and Operating Safety Valves

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December 9, 2014

In a previous article, we explored some common causes of industrial valve leakage, such as incomplete closure, damage, and valve design. These causes are properties of the valve itself, and they can result in significant leakage. However, the most common causes of safety valve leakage we see at job sites are not related to the valves themselves, but rather to improper installation and operating practices.

To prevent valve leakage, here are three things to avoid when installing and operating safety valves.

Valves installed horizontally

Most safety valves are designed, manufactured, and tested to be used vertically, meaning in the upright position with the spindle vertical. Mounting a valve horizontally can have a number of significant adverse effects:

- It may be against regulations and result in a delay of operations if tagged.
- A non-vertical orientation may not provide proper drainage for the valve.
- A safety valve mounted in a non-vertical orientation may not perform as expected: the seat tightness, operation, and set pressure of the valve may be affected.

Improperly installed valves can both cause leakage and pose safety risks. To guarantee that your valves are installed correctly, and prevent damage to both the valve and the system, ensure that the installation company you use is adequately trained.

Stress from improperly installed or improperly supported discharge piping

Discharge piping must be installed so that it supports its own weight and does not put any weight or strain on the valve itself. According to the National Board of Boiler and Pressure Vessel Inspectors, improperly supported discharge piping is one of the top problems that can prevent valves from operating normally. They write:

“Discharge piping connected to the device must be supported so as not to impart any loadings on the body of the device. These loadings could affect or prevent the proper operation of the device including proper reclosure after operating.”

Here are some other common problems with the installation of discharge piping as recognized by the National Board:

- **Piping that is too small.** The discharge piping should be equal to or greater than the discharge opening of the valve.
- **Piping that does not allow for the full range of motion.** When a boiler heats up, it moves up and down, and the installation must allow both the valve and the piping to move along with it. Otherwise, there can be too much stress placed on the valve body.
- **Piping that is too long or has too many 90° elbows.** Most jurisdictions specify the maximum length of discharge piping and the maximum number of 90° elbows permitted.
- **Drain holes that are closed.** The drain holes on spring-loaded safety valves and their discharge piping must be open when required to drain liquid from the top of the valve.

Learn more about [problems that can prevent pressure relief devices from operating normally](#) from the National Board.

Improper differential between operating and set pressure

We see more problems caused by improper safety valve installation than by safety valve operation. That said, the most common operating problems we encounter are those caused by operating the valve too close to its set pressure.

For most safety valves, it is recommended that you maintain a 10% differential between the system operating pressure and the nameplate set pressure. However, seat tightness, and thus valve performance, will be better at a differential of 20%.

If you are experiencing problems with your safety valves, Allied Valve can help you identify and fix the problem so you can get back up and running as quickly and efficiently as possible.