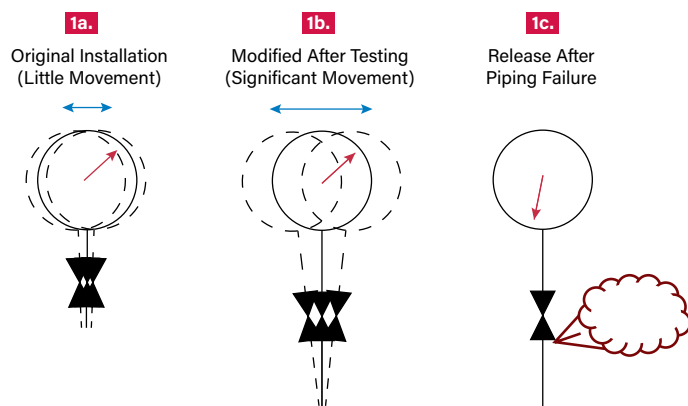


Not All Vibrations Are “Good Vibrations”

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▲ A newly operating compressor system had a pressure gauge connection that moved slightly (Image 1a). A longer pipe was installed for a troubleshooting procedure and left in place afterwards — this increased the connection’s movement (Image 1b). The connection later failed, releasing flammable vapors (Image 1c).

Some equipment such as vibratory conveyors and screens are intended to move, but in most other equipment, vibration is not desirable. It can cause piping and equipment damage, including premature failure.

In one incident, a new compressor system was starting operation (Image 1a). The pressure gauge connection was modified during a temporary troubleshooting procedure by attaching a longer pipe than the original (Image 1b). After troubleshooting, the longer pipe was left in place and the pressure gauge was reattached to it. Vibrations from the compressor were magnified by the longer pipe, and the amount of movement in the system increased. The connection failed, releasing a large volume of flammable vapors (Image 1c). Fortunately, the vapors did not ignite, but they did cause a significant environmental release.

In another incident, during a routine walk-around, an operator noticed a pipe that was moving approximately 1 in. (2.5 cm). He noted that the movement occurred when the rotor on a wiped-film evaporator was out of balance. The imbalance forced the facility to reduce production by 50% to meet quality limits. After repairing the main bearings and the evaporator rotor, the movement stopped and the production rate returned to normal.

Did You Know?

- Imbalanced rotating equipment, pulsating equipment (e.g., reciprocating pumps), and equipment subject to ocean waves may vibrate.
- The flow of fluid through equipment may also cause vibration. Fluid shock (or hammer) can be caused by fluid flow that rapidly stops or starts.
- Flexible connections may be used to isolate equipment vibrations, but such components are weak and prone to failure.
- Rotating equipment may have vibration monitoring sensors that include alarms to warn of excess vibration and impending failure.
- Both the amplitude (i.e., amount of movement) and the frequency (i.e., rate of movement) affect how quickly vibration can cause equipment failure.
- Technology is available to test and analyze vibrations to determine the source.

What Can You Do?

- When walking through the plant, look and listen for vibrating equipment. You may notice something that was missed during maintenance inspections. Report any concerns to your supervisor.
- Changes in vibration can go unnoticed. If the vibration seems worse, it may indicate an impending failure.
- Vibration monitoring alarms indicate an impending equipment failure. These alarms are just as serious as other process alarms.

Vibration is the process telling you something is wrong, so listen to it!