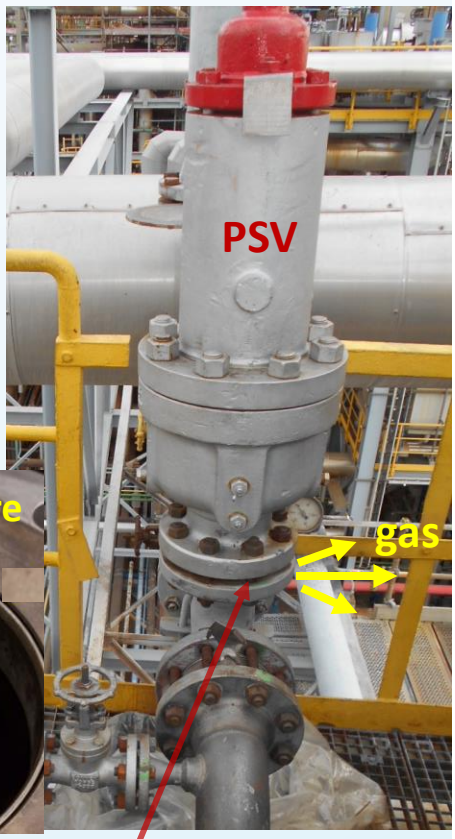
Gas release at a PSV flange

EPSC Learning Sheet May 2025

EPSC



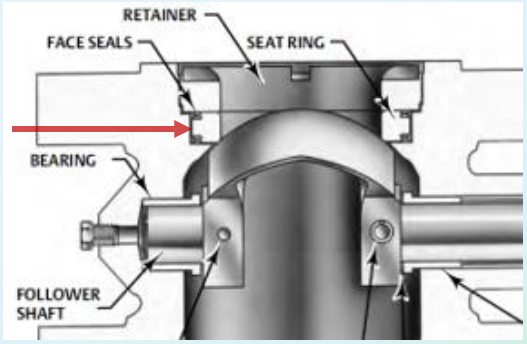
What Happened:

At a Vinyl Chloride plant a line got blocked at the quench tower exit, after a furnace. The main flow was released through a Pressure Safety Valve (PSV) at ca 22 barg. Due to heavy vibrations, bolts of the PSV flange got loose, and several tons of toxic and flammable gas was released.

Carbon deposit from the furnace, pressed this ring down, blocking the V-port ball valve to open.

Aspects:

- Safety valves releasing at high pressure are prone to chattering. This fast vibration did loosen bolts resulting in a flange opening of ca 3 mm. API 521 provides some guidance to minimize PSV chattering.
- It was found that valves where the seating ring is covered by a threaded retainer ring, are better resistant against carbon deposit, that no longer can reach the seating ring.



Avoid that Chattering PSV result in Loss of Containment