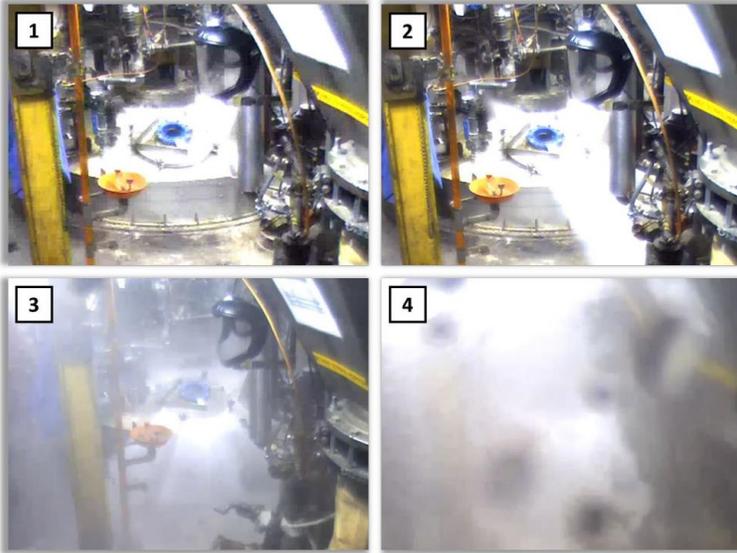


Keep the manway tightly closed

October 2023



The first 6 seconds of the vapor release from the resin vessel manway. (reference CSB incident report No. 2021-04-I-O)

On April 8, 2021, a mixture of flammable naphtha vapors and resin liquid became pressurized and was released through the manway of an operating reactor at a resin plant in Columbus, Ohio. The naphtha vapor spread through the enclosed building and formed a flammable vapor cloud both inside and outside the building. The operator tried to hit the emergency-stop button, but he could not see through the white vapor and had difficulty breathing. He had also been sprayed with hot resin during the release. He evacuated the building and approximately two minutes later, the flammable vapor cloud ignited, causing an explosion and fire.

One employee was fatally injured, and eight others were transported to area hospitals for injuries. The blast shook neighboring buildings, and at least one nearby business sustained damage. The resin plant was severely damaged and was demolished after the incident.

Did You Know?

- Incorrect number of clamps or bolts or improper tightening can cause manways and other covers to leak below the design pressure.
- The gaskets are another key part of sealing hatches. They must be properly rated, correctly positioned and in good condition to provide a good seal.
- Another incident occurred when the manway started leaking before the relief device could open and was the subject of the March 2021 Beacon.
- Adding a volatile material or solvent to a process above the solvent's boiling point can produce rapid boiling also known as flashing. This can quickly increase the vessel pressure.
- All connections need to be properly tightened so any overpressure vents through the relief system and to a safe location.

What Can You Do?

- Know the correct way to secure vessel hatches. Details such as how many bolts or clamps and torque requirements are important to preventing leaks.
- Operating procedures should provide the correct way to secure hatches and manways. If these details are missing, notify the supervisor to add them.
- The correct gasket type, material and rating should also be specified in the procedure for securing openings.
- Leaking flanges often “whistle” or “hiss” as material leaks out. When you hear this sound, leave the area, and ask the area supervisor for guidance.

Tight makes right! Especially for hatches and manways!