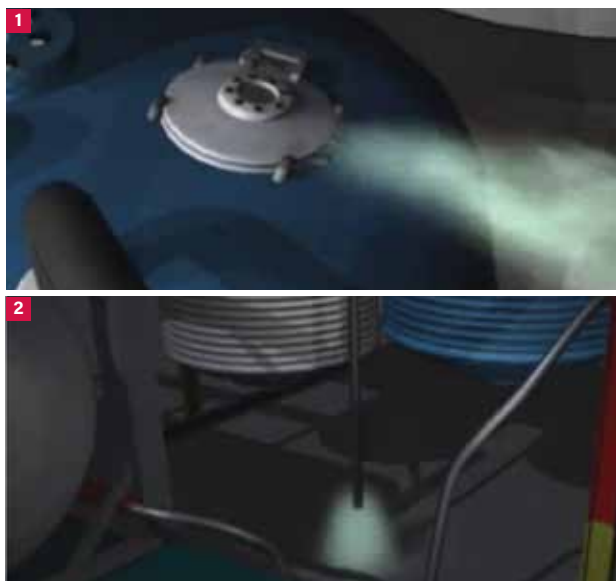


Relief Vents Can Be Hazards

March 2021



▲ Process vapors were able to escape through a poorly sealed manway (Image 1) and a rupture disc vent (Image 2) during a runaway reaction incident. Images courtesy of U.S. Chemical Safety Board.

On April 12, 2004, a plant in Dalton, GA, attempted a first production batch of triallyl cyanurate. A runaway reaction occurred, which released the flammable and toxic chemicals allyl alcohol and allyl chloride to the atmosphere. Some of the material escaped through a poorly sealed manway (Image 1) and more was released through the rupture disc vent that discharged near the base of the reactor (Image 2). The chemical release forced the evacuation of more than 200 families in the surrounding community. One worker received chemical burns and 154 people (including 15 emergency responders) had to be decontaminated and treated for chemical exposure. (Read the U.S. Chemical Safety Board Report No. 2004-09-I-GA for more details.)

A different U.S. company was cited for not venting process relief valves to a safe location during a regulatory inspection. While the vents discharged outdoors, the release point was located directly over an exit from the process building. An employee exiting during a relief discharge would walk directly into a cloud of process materials.

Did You Know?

- Relief devices, whether used in a process or utility service, must vent to a safe location. The safe location for a relief vent can vary based on the material being relieved.
 - Poorly sealed manways can release hazardous materials and expose personnel in the process area. The relief device should be the only overpressure release point.
 - Emissions from relief devices should be known and documented as critical environmental, health, and safety data.
 - The relief discharge should be located to allow vapors to disperse to the atmosphere or liquids to be contained.
 - Vented materials can collect and form a flammable or toxic cloud that could ignite or expose personnel and the community.
 - Changes to processes or equipment in the area must be reviewed for any impacts on the dispersion of relief emissions.

What Can You Do?

- Look for relief vents during plant rounds and check that vents are appropriately labeled as relief lines. If the vent is not labeled, presents an exposure risk, or is located near equipment that could trap flammable or toxic vapors, report the issue to your supervisor.
 - Also report relief vents that are located at a low level that could expose personnel.
 - Ensure systems vent only as designed by checking that all openings (e.g., manways, charge ports) on equipment and piping flanges are properly tightened.
 - During management of change (MOC) reviews, request details and documentation to understand the rationale behind relief discharge location.

Relief devices need to vent to a safe location. Verify that the locations are actually safe.