

# SITE SAFETY ALERT

## SAFETY BRIEFING : Pressure relief valve near-miss events

### The Incidents:

Readymix, concrete and block works have silos on site that are pneumatically filled from road tankers. Many of the sites have silos fitted with pressure relief valves as their only protection from over-pressure. The photographs (right) show how they can be rendered **completely ineffective** by constant use and poor maintenance. Pressure relief valves are **continuously** relieving pressure without the reason being investigated or the cause eliminated. The road tankers are capable of blowing product into the silos at pressures as high as 2.0 bar. The silo, however, is not a certified pressure vessel and is at risk of rupture at any pressure above 1psi. The lack of an effective silo protection system that provides automatic closure of the delivery valve, has resulted in silos being ruptured and filter systems being ejected from the silo roof.

### The Investigation:

This type of event is typical throughout the industry. Site operators do not record the activation of a pressure relief valve as a near miss. Though they happen much too frequently, the root cause of the high pressure is **never identified**. The pressure relief valve should **only** be called upon to operate if the automatic shut off system has failed to close the delivery valve. If the pressure relief valve is forced to operate, it will leave deposits of the powder around the relief valve and surrounding area. The presence of this powder is a clear indicator of an over-pressure event which unfortunately is ignored in the majority of cases. The pressure relief valve must be the last line of defence, not the first. **In too many instances it has been found to be the only line of defence.**

### Action:

- Ensure an **effective automatic shut-off system** is installed to prevent the pressure relief valve from lifting.
- **Regular inspection** of the pressure relief valve is imperative. If there are signs of an event, investigate the cause of the near-miss.
- **Test the PRV** to ensure it is not blowing prematurely. This should be done with a calibrated test rig either on the silo-top or disassembled and removed to test in site workshop. This will ensure the pressure relief valve operates at the correct pressure and should be done every six months at the minimum.
- Service the silo protection system **regularly** to ensure the silo protection auto shut-off system is operational.
- Carry out an **operational test**, not just a visual check on the pressure sensor and high-level sensor.
- Carry out an **operational** pressure test and examination of the pressure relief valve and record the settings every six months at the minimum.
- **Monitor and log** events as trending data will indicate which components are failing. Some silo protection systems automatically log these events.

### Other Learning Points:

- **Never ignore a pressure relief valve lift.** This is an indication of a silo at risk of rupture and it should be considered site has just experienced a near-miss event by over-pressurising the silo.
- Ensure a **regular silo servicing contract** is in place to maintain filters and safety equipment.
- Don't ignore the signs of powder on a silo roof. This is a **warning** indicator that there is a fault with the filter, level or pressure sensors.
- Use a **competent** silo servicing company who utilise all of the relevant test equipment to check the PRV pressure settings and the pressure sensor set points.
- Train staff to **identify, log and monitor** impending signs of danger such as PRV dust build-up, multiple high-pressure alarms and PRV lifts. This will provide invaluable data for preventative maintenance purposes.
- **Train site staff and delivery personnel** on the importance of silo protection, how a system should operate and the consequences of getting it wrong.



Product deposited on silo top around the PRV



Safety compromised as complete blockage



Typical warning signs



PRV seized shut providing no safety release

FOR MORE INFORMATION ON  
HOW TO AVOID THIS SCENARIO AND

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