

SITE SAFETY ALERT

SAFETY BRIEFING : Neglecting maintenance poses pressure danger

The Incidents:

On readymix, concrete and block plants where silos are pneumatically filled from road tankers, it has been identified that there is **serious danger of silo ruptures or filters blowing off** – even with the correct MPA-recommended safety equipment installed. Not only does this pose a direct risk but the risk from **working at height** adds to the problem.

The images to the right show a site where silo protection equipment that was installed over 5 years ago is now defective, due in part to a **lack of maintenance**, leaving the silo at risk. In this instance an **additional risk** was created through regularly having to remove up to ten bags of cement from the top of the silo.

The Investigation:

This type of event is typical throughout the industry. Site operators do not view the activation of a pressure relief valve as a near miss and so it's not recorded. 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 **auto shut-off silo protection system** is installed.
- Effective silo maintenance by **competent** engineers who can identify the issues, the cause and the solution is essential. All of the safety components require physical testing. The pressure sensor must be accurate and fully functional. The pressure relief valve (PRV) needs mechanical or pneumatic testing to ensure its set point for opening is correct. The high level alarms need testing to ensure the filter cannot become blinded.
- **Test the PRV** to ensure it is not blowing prematurely with a calibrated test rig while on the silo. This will ensure the PRV operates at the correct pressure and should be done every six months at minimum.
- Complete a **detailed check on the silo filter unit**, checking cartridges, bags, drain valves and air pressure.
- **Test the auto shut-off** silo protection system regularly to ensure correct operation.
- **Be site aware** and look for visible signs of failure of the delivery process, such as powder on the silo top etc.
- Carry out a **physical examination and test** (not just visual) on the pressure sensor, PRV and high-level sensor.
- **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.



Despite correct safety equipment cement was still being deposited on top of this silo. Seven bags of product were removed prior to this photo.



Sensors buried in solid cement - a clear problem indicator!



This PRV has been replaced twice in 12 months, but the cement visible is due to a faulty filter. This was missed by incompetent service engineers.

FOR MORE INFORMATION ON
HOW TO AVOID THIS SCENARIO AND

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