

Faulty aeration valve causes silo over pressurisation.

WHAT HAPPENED

A pneumatic valve failed in the open position, constantly agitating the silo contents blinding the filters, leading to PRV activation and releasing cement laden air.

As a cement tanker was discharging into the silo, an alarm siren activated. It was initially thought to be the high-level alarm even though the silo had enough capacity. As the delivery was being correctly supervised, discharge was stopped immediately and inlet padlocked. Inspection found cement at the silo filters and evidence of PRV activation, so the silo maintenance contractor was called in to investigate.

They found that the reverse-air filters were completely blinded, but the safety systems, including the PRV and over pressure alarm, had activated, preventing any damage to the silo. Further checks found a pneumatic control aeration valve at the silo base had failed to the open position, constantly feeding compressed air into the silo, blinding the filters, causing silo to over-pressurise, and activating the PRV and alarms. This valve was replaced with an electrically controlled valve that can only fail in the closed position.

The image below shows the pneumatically controlled aeration valve which is designed to only operate during cement discharge to weigh gear, it failed in open position allowing a constant airflow into the silo.



This image shows the silo filters which were completely blinded by agitated cement resulting in over pressurisation alarm sounding and PRV lifting.



LEARNING POINTS / ACTIONS TAKEN

Further considerations

Effective supervision stopped the delivery, and safety systems did their job. However, this incident raised the following questions for consideration.

1. Can you easily tell the difference between the silo's high level or over pressurisation alarm?
2. Can any silo accessories fail in a manner that can affect silo system performance?
3. The silo maintenance contractor has 2 levels for silo service: (1) basic safety checks only, (2) in-depth and after inspection, sets up all silo parameters. Do you know what level of servicing your contractor undertakes?

LOCATION: CONCRETE PRODUCTS PLANT
ACTIVITY: SILO DELIVERIES AND MAINTENANCE
SUB ACTIVITY: NO SUB ACTIVITY AVAILABLE

ALERT STATUS: Normal
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