

Fire risk in powder plants!

At mbar we have seen as many as 5 per year failed oil sealed pumps from processes vacuum conveying powder. All of these have caught on fire creating a **severe risk** for the plant owners.

Two of the known causes for the failures are:

Powder ingress into the pump blocking the oil mist filters

Powder ingress is difficult to protect against as it can be caused by rupture of the pre-filter, incorrect pre-filter type or incorrect fitting of the pre-filter element. Once the oil mist filters are blocked the pump running temperature increases to the auto ignition point for the oil.

Running with open port for extended periods

This can be caused by a valve fault, a loose pipe, a programming fault that has the pump conveying from an empty bin, or a faulty level sensor.

Running with an open port causes the oil to be discharged from the oil reservoir into the exhaust port. This reduces the oil quantity in the pump which then superheats and the oil reaches auto ignition point.

Recommendations

Change the pump type to a liquid ring vacuum pump. This pump uses water to provide the seal. The Petrochemical industry use liquid ring pumps when vacuum is required because of the low risk of ignition.

It is not possible in all circumstances to change to liquid ring pumps because some processes require a lower vacuum level than what liquid ring pumps can achieve cost effectively. A hook and claw pump may be an option. While it doesn't eliminate the risk it does lower it substantially, although it too has vacuum limitations.

A process evaluation should be undertaken for all installations. The final recommendation should become the standard for future installations and upgrades for powder conveying plants.

Living with the problem until upgrade

A high level of maintenance around these processes can minimise the risks.

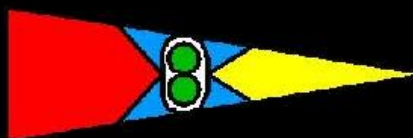
Pump failure caused by poor vacuum levels causing oil discharge from the oil sump.



Leaking oil seals cause fire and bearing failure.



In all cases the pumps could have been saved by an earlier overhaul!



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