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Be Aware of Purged Enclosures in Hazardous Areas

Some enclosures in hazardous areas, such as those that house electrical equipment or analyzers (Image 1), and even control rooms, must be purged and maintained at pressures above atmospheric. Positive pressure prevents gases outside the enclosure from flowing into the enclosure, where the electrical equipment can be an ignition source for flammable vapors or gases.

These enclosures are typically purged with clean air, but may be purged with nitrogen as an alternative or backup (Image 2). If nitrogen is used as a purge gas at your plant, be aware of the potential for an asphyxiating atmosphere inside or near the enclosure. Read the April 2004 and June 2012 Beacons to find out more about the hazards of nitrogen.

1

Photo courtesy Roy E. Sanders

2

Photo courtesy Roy E. Sanders

Did you know?

- Electrical codes and standards, which may vary between countries and local areas, detail how purged enclosures are to be designed and operated.
- The pressure inside a purged enclosure must be maintained within a specified range and monitored to ensure that any vapor leaks are flowing from inside the enclosure to the outside atmosphere.
- Pressures above the specified range can be hazardous. For example, an engineer was killed in May 2017 while removing an enclosure cover that was 14 in. (0.36 m) wide and weighed 12 lb (5.4 kg). The enclosure was at an excessive pressure because of a leaking purge-gas component. As the engineer removed the cover, it flew off and hit the engineer in the head. (http://safetyzone.iogp.org/SafetyAlerts/alerts/Detail.asp?alert_id=288)
- To maintain the correct pressure inside the enclosure, keep doors or other openings closed and sealed.

What can you do?

- Be aware of any purged enclosures in your plant, and ensure they are operated correctly during routine plant rounds.
- Check the pressure in enclosures, and report any out-of-range readings. Image 3 shows a pressure gage that indicates the safe range in green.
- Ensure that all doors or other openings in purged enclosures are closed, and that the enclosure is properly sealed.
- If maintenance is required inside a purged enclosure, be sure to get the proper permits for the work. Be aware of the potential for overpressure, and check the pressure before opening the enclosure. Ensure the enclosure is closed, sealed, and that the purge is operating properly when the work is finished.
- If your enclosures use nitrogen as the primary or backup purge gas, be aware of the potential for an inert atmosphere inside or near the enclosure. Check the oxygen level of the atmosphere before going inside, even if the nitrogen alarm is not warning of high nitrogen concentration.

3

Make purged enclosure checks a part of your plant's routine!