



How can operators overcome safety-related obstacles in explosive environments?

Hazardous manufacturing and production can be complex, with many factors at play. Despite the many safety improvements made by the industry in recent years, some risks can never be fully removed; only be better managed and contained.

Recent safety improvements are often due to greater awareness of the perils at play in explosive environments – as well as businesses investing in safety measures and operators taking steps to reduce risk. But how can operators overcome more pervasive safety concerns in hazardous environments?

Invest in site-specific tech to minimise onerous admin

The term 'hot work permit' will be well-known to operators in these industries. Hot work permits are often seen as being an essential part of working in hazardous environments – but the admin involved can be onerous. Inspections in hazardous environments are complicated enough without adding extra elements to your workload. What if you could inspect without having to provide copious amounts of paperwork?

A growing number of operators in potentially explosive atmospheres are managing to

circumvent the hot work permit by using specially created tech that is specifically designed to inspect without creating a new hazard to the environment. For example, thermal imaging devices enclosed within a sealed, spark-proof casing can be deployed at a moment's notice - eliminating the paper trail of hot work permits.

Let's look at a recent example: Anglian Water is avoiding the need for hot-work permits for asset inspections by using thermal imaging cameras that are specifically designed to be used safely in Zone 2 ATEX environments. As Anglian Water is the UK's largest water and sewage company by area – supplying 2,5 million homes and 110,000 businesses through a network of water treatment plants – that's no small task.

The company uses several thermal imaging cameras to uphold robust safety measures in gas monitoring, saving time and man hours. This allows them to instantly inspect machinery without the need for prior approval, as the cameras used are certified to prevent ignition of any atmosphere, thus protecting both operators and assets.

Ian Spriggs MIET, DSEAR Manager for Anglian Water Services Limited, and

member of the CompEx technical advisory council, explains how the team is using thermography to reduce risk and improve safety: "We use a combination of vibration analysis and thermal imaging to carefully inspect mechanical assets in at-risk areas to ensure maintenance has been done robustly."

Critically, Ian is also actively involved in several internal and external groups such as the CompEX non-electrical working group, of which he says: "The standards for mechanical assets are a long way behind electrical and they need to be brought up to speed. I am recommending that thermography be used in at-risk environments to reduce risk and offer more scope for faster, safer inspections across sites globally."

Seek out air leaks before energy costs spike

Similarly, if your site employs the use of pressurised air to operate machinery, you could be unknowingly losing money in the form of undetected air leaks – driving up energy consumption and associated operating costs. As much as 30% of the energy used in compressed air systems is lost to air leaks.

Let's look at the numbers. Assuming a minimum loss of 10% and a maximum of 30%, a typical manufacturing company could be losing somewhere between \$10,000 and \$60,000 per year in wasted energy. Add to that the fact that the longer a leak goes undetected, the more chance there is that it will get worse, further compounding the problem.

Further consider the additional wear and tear on the equipment, which increases the maintenance costs and hikes up the capital cost of replacement; it's a significant loss on investment for air alone.

Luckily for manufacturers, there's now a powerful and precise preventative measure to stop such costly compressed air leaks in their tracks: acoustic imaging. If you're not yet exploring this as a tool to minimise risk and admin, why not? It's a powerful, portable solution that has the ability to transform maintenance inspections while driving down risk.

Plan inspection routes to minimise exposure

With the inherent dangers present in hazardous environments, it is prudent for operators to minimise potential exposure at every turn. However, this doesn't need to remain limited to the confines of a hot work permit. Operators can and should ensure that even the most seemingly mundane element of an inspection is curated in advance to better prevent unfortunate accidents.

One, perhaps surprising, way of doing this is by planning inspection routes ahead of time, either manually or with specific software which facilitates this; it's an easy win in terms of ensuring efficiency is maximised while exposure to potentially problematic elements is reduced. I'd advise creating a list of the assets you need to inspect at each location and organising it in the most efficient order.

Prioritise predictive maintenance

While ad hoc repairs may be tempting to reduce maintenance spend, it ultimately can cost much more to wait until machines fail. In fact, preventative maintenance can reduce breakdowns by a staggering 70% and lower maintenance costs by as much as a quarter.



Also called condition monitoring, it allows operators to catch issues early, plan repairs in advance and avoid unnecessary downtime – ultimately boosting productivity by as much as 25%.

Prevention is better than the cure – effective condition monitoring can prevent downtime, keep repair costs down and ensure operating costs stay competitive.

Instead of working machines to failure, creating a schedule of planned condition monitoring can yield benefits that boost both your productivity and your bottom line.

These include:

- Extending the lifespan of machines, motors, and systems
- Reducing energy expenses
- Avoiding unplanned outages and unexpected downtime
- Drastically cutting the time needed for maintenance
- Optimizing maintenance programs
- Improving asset management decisions

Hazardous environments can be found across many industries. Take a water treatment plant, for example.

Whatever specific hazards you're dealing with in the immediate environment, be it gases, dust, vapours or mists, accurate, tech-based condition monitoring can minimise risk and maximise savings.

From detecting compressed air leaks to identifying partial discharge, overcoming

safety-related challenges can be as simple as rejecting the idea of 'business as usual'. Instead, prioritise efficiencies and use the growing array of high-performance tools to map degradation and identify patterns in equipment to detect problems before they can worsen – all while underpinning greater safety protocols and mitigating risk on a measurable scale. ■

About the author



Rob Milner, Director of Global Business Development at Teledyne FLIR. He has been with Teledyne FLIR for 23 years, having previously worked as a research metallurgist. In his own words: "I get up every day doing my best to achieve our mission of saving lives and livelihoods by supporting key clients to solve problems. My approach to problem-solving is to use a consultative, empathetic, holistic approach to fully identify opportunities for solutions and flag potential obstacles. I am a tenacious, focused, strategic thinker who looks for opportunities to create repeatable processes."