

Fire safety solutions

High value and safety critical industries such as aluminium are not strangers to risk. Fire is one such risk. And yet the fire safety is often neglected or misunderstood. Many in fire safety positions do not understand the physical properties of the fire extinguishing systems in place which are installed to put out fires once started. The gases contained in cylinders - the chemicals which put out the fire once the system has been activated – are also misunderstood. This article aims to close gaps in the knowledge about fire safety for those unaware about fixed fire extinguishing systems and to share innovative methods for inspection and continuous monitoring of these systems which even the most experienced may not yet know.

Typically, aluminium does not burn, it melts at very high temperatures. The heat is conducted away so the temperature will rapidly increase elsewhere in the vicinity. The need for comprehensive fire safety measures, specifically the fixed fire extinguishing systems in aluminium production and fabrication, in casthouses, foundries, recycling and reclamation plants. The super high temperatures at which aluminium is handled especially at molten points, sow casting and charging. Fine aluminium particles are particularly prone to ignition.

Incidences of fire

■ Devastating fire destroyed a 2800 sqm aluminium plant, which was described as a “total loss”. On December 30th 2016, fortunately there were no fatalities but there were two injured workers. To emphasise how varied the start of fires can be, this plant’s fire was started by the buffing machine used to clean the floors which emitted sparks, resulting in the explosion. (Source: <http://aluminiumplantsafety.blogspot.co.uk/2017/01/floor-cleaner-blamed-for-explosion.html>).

■ “A huge fire broke out in an aluminium

and lumber factory in the Middle East [sic]. The fire started in the early hours one day during the week of June 28, 2015 and initial investigations showed that the fire extinguishing system did not work. The sources added that the presence of lumber and diesel tanks in the factory worsened the situation but around 90 firemen, from six fire departments, fought the flames and helped contain the fire in three hours and prevent it from spreading to adjacent facilities. Two firemen were injured in the process and were treated on site.” This incident emphasises “the need to regularly check fire detection and suppressions systems in your plant.” (Source: <http://aluminiumplantsafety.blogspot.co.uk/2015/07/the-fire-extinguishing-system-did-not.html>).

Under Pressure!

Extinguishing agents CO₂, FM-200®, Novec™ 1230, halons, etc are commonly used agents in the fixed fire extinguishing systems protecting aluminium facilities. Gases under pressure are often considered as passive cylinder columns of solid material from the perspective of their monitoring following installation. However, being under pressure and constantly changing under temperature means the gases should be considered active.

Fixed gaseous extinguishing systems

These gases leak. It is not a widely-promoted fact in the fire safety industry, except by some experts, and by those who understand the physics behind pressurised gases. If the agent leaks, they may be insufficient gas to suppress a fire in the event they are activated. If there is no agent, the fire will continue to burn

and may lead to catastrophe by loss of life, and certain business downtime. They are active and dynamic systems, which require constant monitoring to ensure safety of life, and increase resilience and business continuity. Thus, saving time and cost long-term by improved monitoring.

Constant monitoring

Aluminium plants are expensive to build and maintain. It generates significant heat. The value of them are very high but the value of their inability to sustain business continuity is likely to be higher than their physical assets. And yet Insurers are asked to underwrite them and the fire industry to deliver their protection at the cheapest price. Who today would consider installing an alarm system without monitoring its overall daily status - not only on its actuation - and then integrate the alarm system into the building management system, with central monitoring being essential? Who would build plant fitted with power generating auxiliary machinery, without installing emergency power systems or monitoring their condition states? These are basic engineering principles of building redundancy into one’s systems and subsequently monitoring one’s systems. There are clear advantages for the plant and insurers.

Business continuity

The industry still approaches the installation of a dynamic and pressurised fixed gaseous extinguishing system as if it needs no integration into a BMS/SMS, except alerting on actuation. Nor does it think it needs constant monitoring, lest it reveals the underlying engineering risk of them. Can this be because good engineering is

Portalevel™ MAX delivers the liquid level content readings and Portasteel™ calculator converts these to ones of weight and mass



*Clare Hunter, Head of Marketing & Communications, Coltraco

left unrewarded in fire safety matters? Or might it be that the fire industry is more concerned to negate customer awareness of its need lest it reveals that pressurised systems do discharge and leak? These are needless concerns. All good engineering demands the monitoring of dynamic structures and a highly pressurised cylinder is a dynamic structure. It is designed to protect a critical infrastructure or asset. Without constant monitoring a risk is generated in the very environment for which it is designed to reduce risk. The risk is not only to the asset, but to the people who work in the asset and their ability to enable business continuity in the high value asset under risk.

Solution: Continuous monitoring of fire extinguishing systems

Ultrasonic solutions are available for the inspection, and now for the continuous monitoring of the contents of fire extinguishing systems. This enables the plants' facility managers, health and safety managers and fire officers to increase the regulatory annual checks to monthly or even weekly in their plant's safety management system.



Permalevel® Multiplex is the only 24/7, 365 ultrasonic continuous monitoring system of fixed fire extinguishing systems cylinder contents. It can be configured to provide local and remote alarm. Integrated into the existing safety management systems by selected communications capabilities. Available only from Coltraco Ultrasonics, this is leading technology, coming to the market to fulfil the "Ungoverned Space" of fire safety across all industries, especially high value, safety critical ones as aluminium.

Conclusion

Coltraco Ultrasonics is a British designer and manufacturer of ultrasonic solutions for improving safety. Coltraco aims to be the lead technical authority in the constant monitoring of liquefied and non-liquefied

gaseous extinguishing systems contents during the life of the system once it is installed and commissioned.

Coltraco achieve this through 30 years' experience since inventing the first handheld ultrasonic liquid level indicator Portalevel® - today available in nine models including soon an Intrinsically Safe ATEX Zone 1 variant. Coltraco's ability to establish the liquid contents of liquefied clean agents – through UL & ABS approved Portalevel™ MAX has led to the research and development into the innovative monitoring system Permalevel™ Multiplex. Once the liquid level is identified, Coltraco can establish the agent's weight and mass – through Portasteel™ Calculator (the world's first product capable of this).

These Safesite® solutions enable the safety managers to pinpoint exactly when and if a leak in agent occurs – enabling rapid rectification of the issue by organising a refill of agent. Such effective, easy to use, accurate and reliable solutions can improve the facility's fire safety measures. ■

Contact

cmehunter@coltraco.co.uk