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The “Ungoverned Space” in the Fire Industry and Safe Fire Engineering Practice

by Dr. Carl Stephen Patrick Hunter

There exists much “ungoverned space” in the fire industry. Whether in regard to installation, commissioning, or servicing there are too few qualified engineers who may be considered subject matter experts. In terms of extinguishing systems there exist two broad categories: sprinkler systems and gas systems. The former can suffer leakage but the latter can cause catastrophic effect given its physical pressures. Overall, the value of the assets that fire systems are protecting is increasing rapidly, but the competitive nature of the free market in the fire industry places great pressure on it to deliver systems which comply with the regulations and deliver asset protection at the most economical cost. Too often fire protection is seen as a cost rather than an investment.

Anecdotes and Experience

Our experiences in the fire industry globally have included wonderful ones of professionalism and care from dedicated fire engineers and risk managers. Many of our products and systems today and others that we have under development are the direct result of advice and guidance that we have received from these very fine fire engineers.

Set alongside these, however, are highly concerning anecdotal experiences such as:

- Systems portrayed and installed by contractors as Novec 1230 but filled with sand or water.
- High pressure gas systems without the means to actuate them.
- Cheap pressure gauges sticking in position under humidity or mechanical fatigue.
- Safety pins being retained in position in the cylinder valves after installation.

- Marine CO₂ systems with 20 percent of the cylinders installed on commercial shipping being empty or partially filled.
- Over-filled and under-filled cylinders.
- Pipework and cylinders freshly painted but with severe internal corrosion.
- Room integrity testing with questionable results and with the room integrity remaining unmonitored after testing.
- Liquefied extinguishants being confused by installers with inert gas systems.
- A lack of understanding of the organic compounds of some liquid extinguishants and their corrosive effect on the cylinder in the event of condensate ingress.
- Shipping companies not implementing the FSS code of the IMO SOLAS regulations.
- Individuals asking how to operate portable Portalevel liquid level indicators on dry powder extinguishers.

Everyday Challenges and High-Risk Outcomes

Marine servicing companies bid to service a ship’s CO₂ system; this can comprise 200–600 100 lb CO₂ cylinders per ship. These are under high 720 psi/50 bar pressure. They can discharge accidentally. One of the highest probabilities of discharge occurs during their maintenance. Some service companies estimate that at one time or another 20 percent of a ship’s CO₂ cylinders have discharged or partially leaked their contents. There are over 55,000 commercial vessels at sea at any time. On average each cylinder will take forty minutes to dismantle, weigh, record,

and re-install. Too many times, good servicing companies may not have the physical time to perform the inspection required.

But alongside them there are other companies who are said to randomly check some cylinders and then place “tested” stickers on the rest. Because the normal design concentration of CO₂ of 34–72 volume-to-volume percent is above the nearly immediate acute lethality level, an extremely narrow safety margin exists for these systems. Its mechanism of fire suppression is through oxygen dilution to 8–15 percent, not the chemical disruption of the catalytic combustion chain as with other clean agents.

Ultrasonic Technology

It seems unfathomable, then, that these systems are not permanently monitored rather than leaving them to stand alone unsupervised and unmonitored 364 days a year until their annual certification check. One of the key advantages of ultrasonic measuring solutions is they allow a comprehensive maintenance program to be implemented as part of a strategic approach to business continuity. This leads to reducing the risk of accidental discharges and leaks not being picked up, reducing areas of ungoverned or unregulated space within the industry, and ensuring a safer working environment for all.

These technologies offer great opportunity to the fire industry. They ensure a customer has full confidence that a fire company has installed a gaseous extinguishing system with a semi-autonomous monitoring capability to safeguard it and their asset, whether onshore or offshore. The customer-supplier relationship becomes an embedded

and joined one, providing further opportunities for both parties.

Creating Added Value While Minimizing Risk

This creates additional value which leads to revenue reward. This is of particular pertinence to companies who have a high public profile such as high-rise hotels, an example being the Address Downtown Hotel fire in Dubai on December 31, 2015. What CEO of a hotel company, for example, wants to be shown to have installed a fire system that is left standing and unsupervised for 364 days of the year until the return of the servicing company for its annual certification check?

Smart Solutions

This is the “ungoverned space” but in it technology offers many solutions. Who today would object to vehicle safety restraint mechanisms? Who today would willingly replace a “chip and pin” credit card with one requiring only a signature? As the world changes, so must our industry integrate technological solutions to provide a bulwark against wider industry misinterpretation and minimal, even occasional and flagrant, disregard in the application of standards and good global engineering practice, creating standards which all can understand and apply.

The “white heat” of technology shines as a beacon of hope to our industry and so too enables justification for customers to actively engage in the monitoring of gaseous fire extinguishing systems as an integrated and essential element to their business activity. ❖



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