What are the essential considerations for functional safety and hazardous area management in water & sewage treatment facilities?

It could be suggested that in recent times any focus for DSEAR periodic safety reviews and its implications on safeguards may have tended towards recognizable high hazard facilities that would relate to sectors such as oil & gas and chemicals installations. For other sectors where the potential for fire and explosion may not be as readily envisaged e.g. the water, sewage and utilities sector, the water and sewage quality and the performance of water & sewage treatment plants can similarly impact on reliability, process safety, financial performance and the integrity of equipment and systems when not managed appropriately.

As with other sectors, there may be issues with ageing assets which may be obsolete, inefficient or unreliable. There may be evolving changes in sewage quality, modification or reconfiguration of the operational infrastructure or treatment demand. To this end, these issues require active hazard and risk management which drives the operator to further focus on new equipment to be specified, existing equipment to be upgraded and the performance of existing equipment to be evaluated. Included within this duty of care, is the ever more demanding legislation, as public scrutiny increases the need for operators to demonstrably improve the safety of their operations. As part of the operator’s process safety
obligations, there is the obvious potential for flammable atmospheres to occur in ‘recognizable’ systems and equipment such as bio-digesters and sewage treatment underground works.

However, current industry challenges for hazard identification may need additional attention to be aligned for other parts of the operational facility where it may be harder to quantify where flammable atmospheres will occur or not. An example is transient methane conditions in underground networks that may cause an explosion when not expected to be a credible hazard scenario given any uncertainty surrounding the rate of generation of flammable gases. As part of overall safety, the functional safety requirements for Hazardous Area Management in water and sewage treatment works often requires the experience and input of a broader technical assessment team when it comes to compliance for requirements such as DSEAR and zoning management.

Operators of such facilities should be undertaking a scheduled periodic review of the risk assessment and zoning for plant and equipment which should include contributions from process engineering, operations and engineering teams facilitated by a knowledgeable and robust chair to lead the assessment exercise. This is required to determine if there is the potential to encounter unknown hazards and to agree a defined strategy for how to deal with them. Available guidance tends to focus on suggested zones being established from previous operating history and not necessarily focusing on expanded process safety implications. As we all recognise, recent incidents and accidents may provide greater insight to improve safety, but obviously hindsight is a luxury that can be ill afforded when it comes to protecting people, the environment and the asset base.

**Consider whether you would you be able to answer the following questions confidently and in full?**

- Do you have a plan in place to regularly review your DSEAR risk assessments and zoning?

- Do you bring together process and operational teams to review credible scenarios and test the boundaries of what may be possible?

- Are you delving into the detail of the relative chemistry involved and undertaking a deep dive review for your basis of safety?

- And not forgetting, who is responsible for all this and who provides the competency assurance for all those involved?

Our experience identifies that “good safety is good business” and that operational complacency to potential risk will inevitably catch you out…
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Visit our Hazardous area management web pages.