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Innovate or simplify in Process Safety hazard identification

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ABSTRACT

Process Safety and Engineering professionals spend considerable time undertaking formal hazard identification and risk assessment activities such as HAZID, HAZOP, CHAZOP, LOPA, Consequence Analysis, Risk Analysis, often across multiple project phases.

However, across many industries, a significant proportion of Process Safety Events (PSEs) ultimately arise from failures to contain or control hazardous substances and energy.

Can we make process safety this simple? The principle that “What you don't have, can't leak...” was articulated by Trevor Kletz in 1978, following the Flixborough explosion four years earlier, the UK's worst industrial chemicals accident.

Although Flixborough ultimately resulted in a catastrophic loss of containment, it originated as a loss of process control. A pattern also evident in events such as Seveso and the Beirut ammonium nitrate explosion.

These events can be conceptually classified as Type 1 PSEs, being loss of containment, and type 2 PSEs, being loss of control that may escalate to cause loss of containment.

Drawing on recent project and operational experience, this paper demonstrates that for many industrial processes with major accident potential, hazard identification can be significantly strengthened by prioritising loss-of-containment scenarios. Practical examples are presented, including less commonly recognised causes of containment failure and the preventative controls applied.

In more complex industries and operating scenarios, where loss of control can precede and drive loss of containment, a complementary focus on maintaining effective control is required.

For these cases, the paper illustrates how a “keep it controlled” mindset can be integrated into existing hazard identification approaches, supported by examples from recent experience and the control strategies applied.

KEY WORDS

Keep it contained, keep it controlled, HAZID, HAZOP, simplify, new technology hazards

BIOGRAPHY

Richard has over 40 years' experience across many industries and countries. He is a senior principal consultant providing safety and risk consultancy and services to projects. His in-depth knowledge of flammable and toxic hazards, the associated consequences and industry best practice safeguards help reduce risks to ALARP or SFAIRP. Richard is an experienced workshop facilitator for HAZID, ENVID, HAZOP, LOPA, SIL, CHAZOP, SAFOP, SMS, layout and PHA leadership.

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