Challenges and needs for process safety in the new millennium

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ABSTRACT

Process industries have made quite a bit of progress in process safety since the tragic night of December 2, 1984 in Bhopal. Nonetheless, incidents continue to occur on a regular basis due to insufficient understanding of the urgency to identify best practices and drive for process safety improvements in the organization. This paper addresses some of the critical challenges in implementing effective safety programs: (a) failure to learn from past incidents and to capture those lessons into process design, procedures, training, maintenance, and other programs, (b) insufficient attention to leading indicators, and (c) an increase in complexity of process operations and lack of communication. In the presence of these challenges, there is a great need to develop better solutions by utilizing good science based approaches and best practice studies. Potential research areas include, but are not limited to, incident database analysis, reactive chemicals, inherently safer design, combustible dust explosion, facility siting, and the flammability of fuel mixtures and aerosols. In addition, an example was presented on LNG industry safety to illustrate that science-based research is needed to ensure the safe operation and to avoid or mitigate unintended consequences.

Keywords: Bhopal; Process safety; Leading indicators; LNG