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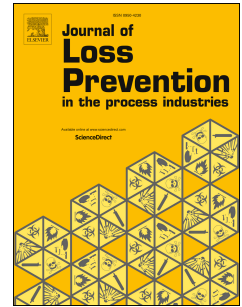
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Challenges in Applying Process Safety Management at University Laboratories

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Abstract

Risks associated with academic research are often perceived as being much lower than risks within large-scale process industry operations. While the inventories of hazardous materials are lower within the university environment and the number of hazards may be lower, factors such as materials of construction used in laboratories and the proximity of researchers to their equipment may equate to high individual risk for lab workers. Worldwide, the number of reported lab accidents that have resulted in fatalities, severe injuries and financial losses demonstrates that there is a need for better risk management practices within academic teaching and experimental research labs.

Academic and research laboratories within universities contain a diverse array of hazards, and the risks associated with these hazards can be significant if not properly managed. The misperception that university labs are “low risks” and “inherently safer” remains within and outside academia, in part, due to a lack of hazard awareness.

This work discusses a proven approach to applying the principles of process safety management, widely used in the process industry, to teaching and research laboratories within an academic environment and discuss selected challenges and suggested solutions.

1 Introduction

Implementing a risk management system within universities is a fairly uncommon concept which became more common in recent years after an unfortunate series of high-profile catastrophic laboratory accidents over the world served as a wake-up call for universities. Sadly, these accidents remind us that universities are not exempt from accidents involving process operations. The regulatory requirement mandating companies to adopt process safety management practices only for processes containing quantity of hazardous chemicals over a predetermined threshold has led to a false sense of security for facilities operating under the threshold limit. In fact, this misconception that process hazards do not exist within “small” facilities or laboratories has led to a lack of process safety hazard understanding and has led to financial losses, property damage, environmental disasters, injuries and, worst of all, fatalities within university and research labs as well as small operating companies.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) identified 120 university laboratory incidents between 2001 and 2011 (CSB, 2011). The Lab Safety Memorial Wall collected by Lab Safety Institute summarizes some of the reported fatal accidents at laboratories

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