



21st Annual International Symposium
October 23-25, 2018 | College Station, Texas

Risk Based Process Safety for Semiconductor Fabrication Operations

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Abstract

Most semiconductor manufacturing facilities do not contain quantities of highly hazardous chemicals in threshold quantities sufficient to be subject to the Occupational Health and Safety Administration's (OSHA) Process Safety Management (PSM) regulations. However, some organizations are applying Risk Based Process Safety (RBPS) concepts as a systematic means to not only ensure EHS risks are identified and quantified, but also to strengthen overall business performance and provide competitive advantages. Aging Fabrication facilities and infrastructure, their ever-increasing production demands, rapid innovation and need for process modifications are also business drivers for RBPS. The core RBPS concepts not only provide a holistic approach to protect employees from catastrophic accidents and releases; but in most cases also drive production efficiencies, increase equipment/tool reliability and life span, promote quality improvements, and enhance business continuity measures. This is accomplished by application of a wide range of process safety management elements, as applicable to semiconductor operations, which fall under the following four basic pillars of RBPS: Process Safety Leadership/Commitment; Risk Assessment/Identification; Risk Management; and Learning and Continuous Improvement. This session will discuss the basic concepts of RBPS, including a brief review of the 20 elements as provided by the Center for Chemical Process Safety (CCPS) framework, and present the benefits of developing and implementing process safety management systems for semiconductor processes. Case studies will be presented, as applicable, to detail the advantages, as well as the challenges, of RBPS for the semiconductor industry.

Keywords: Process safety, semiconductors, risk based process safety, risk management, risk identification