Process Safety Management

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ABSTRACT

Process Safety Management (PSM) is generally defined as the application of management systems to the identification, understanding, and control of chemical process hazards in order to prevent accidental releases.

During the past 20 years, a number of chemical or related incidents in the petrochemical industry have adversely affected surrounding communities. A few of these incidents, such as the vapor cloud explosion in Flixborough UK in 1974 [12], the LPG explosion in Mexico City in 1984 [12], the toxic material release in Bhopal India in 1984 [12], and the fire and radiation release in Chernobyl USSR [12], were reported worldwide. Both governmental agencies and trade organizations responded by developing standards and regulations to improve process safety. The American Petroleum Institute (API) [10] and the American Chemistry Council (ACC) [15] started to work with their members to develop PSM organizational guidelines. The Clean Air Act Amendments of 1990 required both the Occupational Safety and Hazard Administration (OSHA) and the U.S. Environmental Protection Agency (EPA) to develop standards to protect workers and the public and environment respectively.


The PSM regulation covers chemical and petroleum processing plants that contain one of the listed toxic materials or flammable gases and liquids above a threshold quantity. The threshold quantity for flammable liquids is, for example, 10,000 pounds or equivalent of about 20 barrels of oil. Although a first glance would suggest that only those portions of the chemical process unit containing the listed toxic or flammable fluids would be subject to the OSHA PSM rule, actually any adjacent unit that can ultimately cause a catastrophic release of the toxic or flammable fluids will also be covered by PSM. In addition to the vast majority of chemical manufacturing facilities and petroleum processing plants, facilities such as water chlorination and ammonia refrigeration may also be covered.

The OSHA PSM rule contains a few exemptions, such as gasoline retail facilities, oil & gas drilling operations and pipelines. Unattended facilities are also exempt from PSM regulation.