

Using a Piping System Model for Process Safety Management

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Introduction

A Process Safety Management of Highly Hazardous Chemicals (PSM) program is mandated by OSHA (standard, 29 CFR1910.119) to prevent the unwanted release of hazardous chemicals exposing employees and others to serious hazards. The PSM program requires a systematic approach for evaluating the process including the process design, process technology, operational and maintenance, emergency preparedness plans, along with a training program. It requires an evaluation of the total system to minimize or eliminate chemical releases occurring as a result of failures in the process, procedures, and equipment.

A properly conducted PSM is a team effort in which the company and employees work together to develop the necessary expertise, experience, judgment, and proactive initiative to implement the plan. This requires everyone involved with the PSM to have a clear picture and understanding of the process. Since many of the hazardous chemicals covered under a PSM are in either a liquid or gaseous state, being able to gain a clear picture as to the operation of all the elements in a piping system can be a key element of the plan.

Process Safety Management

The requirements of the Process Safety Management plan requires the employer to have written instructions detailing the methods in

which they will design, operate, and maintain the plant to minimize the inadvertent release of highly hazardous chemicals. The following areas must be included in the Process Safety Management plan:

- Employee Involvement
- Process Safety Information
- Process Hazard Analysis
- Operating Procedures and Practices
- Employee Training
- Contractor
- Pre-Startup Safety
- Mechanical Integrity
- Non-routine Work Authorizations
- Managing Change
- Investigation of Incidents
- Emergency Preparedness
- Compliance Audits

The remainder of this article describes how commercially available fluid piping software can be an integral tool in developing and implementing a PSM program. A variety of fluid simulation packages are available that can be useful in developing a PSM; the examples presented in this article use the PIPE-FLO program by Engineered Software.

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