

If Your PSM Is So Great, Why Are You Still Having Accidents?

ioMosaic Corporation

Although most companies that handle hazardous materials have implemented process safety management (PSM) systems, they are still having accidents. These same companies have good audit programs that verify compliance and implementation of good management systems, but hardly any look at the quality of the audited programs. A company can have a PSM program that meets regulatory requirements, but is not effective in preventing accidents. Having a good management system in place may help, but is still not enough. The problem is the quality of many PSM programs is poor and there is no mechanism in the audit program to identify these quality issues. For example, after an accident has occurred, how often do you find that your process hazard analysis failed to identify the actual or similar scenario, concluded that there were adequate controls in place, or failed to follow-up on recommendations that might have mitigated the accident?

Identifying quality issues in PSM systems is difficult, because it requires that the auditor have considerable experience in the PSM elements being audited and it is more time consuming than a typical compliance audit. However, given the extensive resources that most companies have already spent in developing their PSM programs, it makes sense to make sure that they are not only in compliance, but also effective in preventing accidents.

For example, a compliance and management systems audit of a process hazard analysis (PHA) program, that uses the hazard and operability methodology, would verify that procedures, training, documentation and follow-up were in place, but would not look at quality issues such as:

- Are study sections selected to allow effective analysis?
- Is the design intention of each study section defined to determine credible deviations?
- Have all hazards of concern been identified?
- Have scenarios been developed to the ultimate consequences of concern?
- Have multiple failure scenarios been considered?
- Will the existing controls listed actually reduce the risk of the scenario?
- Has the risk of each scenario been evaluated at least qualitatively?



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- Does the frequency of each scenario reflect the existing controls?
- Are there established criteria for what risks are acceptable or tolerable?
- Do recommendations reduce risk to an acceptable level?
- Do recommendations include inherent safety concepts and engineering controls where practical?

Any of these issues can have a significant impact on the quality of a PHA and would most likely not be identified during a typical audit, unless performed by an auditor that also had a considerable amount of PHA experience.

For example, a typical compliance audit finding might be: *There is no documentation that five of a sample of 20 PHA recommendations had been implemented.* In a quality audit a typical finding might be: *PHA recommendations do not always reduce the risk (frequency and/or consequences) of a scenario.*

The quality finding is one that only someone with experience in PHA and risk assessment could make. Therefore the team composition for a PSM quality audit is critical.

There are at least two ways to address the quality of PSM programs. The first is to expand the scope of the existing PSM audit program and the other is to conduct a separate review. Under either option, the entire PSM program could be reviewed for quality or PSM elements could be reviewed individually. Of the 14 OSHA PSM elements, those that have the most potential for quality issues are:

- Process safety information
- Process hazard analysis
- Management of change
- Operating procedures
- Mechanical integrity
- Training
- Incident investigation

The PSM quality review is done in a similar fashion to an audit, except that the findings will be based on good industry practices. This review should only be done in conjunction with or after a traditional compliance audit has been conducted. A team of individuals with experience in developing or implementing PSM elements reviews the applicable procedures and documentation and identifies weaknesses, using a separate quality audit protocol. In addition, the PSM quality audit should include observation and oversight of the PSM program. For example, a PSM quality audit of a PHA program should include observation of a PHA team review session. During this observation, the auditor would evaluate many of the PHA quality issues listed earlier. There is an advantage to doing both the compliance and quality audit at the same time, as much of the same information will need to be reviewed and many of the same individuals will need to be interviewed.

PSM programs have reached a high level of implementation in many companies. These companies have audited their PSM programs to verify compliance

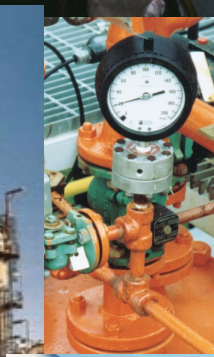
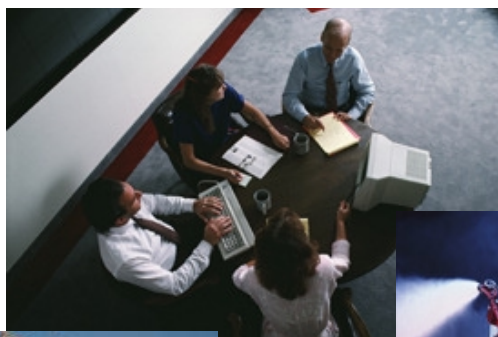


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and implementation of management systems. These audit programs are important to have a functional PSM program, however in order for a PSM program to be effective in preventing accidents, each PSM element must have a high level of quality that reflects good industry practice.

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Mr. Ozog is an expert in process safety and risk management, process hazard analysis (HAZOP, FMEA, FTA), and process safety auditing. He has helped numerous companies and governmental agencies identify process risks and implement cost effective mitigation measures. He teaches courses in each of these areas and is also an instructor for the American Institute of Chemical Engineers' Educational Services.

Mr. Ozog has a B.S. and M.S. in Chemical Engineering from the Massachusetts Institute of Technology. He is a member of the American Institute of Chemical Engineers and serves on various sub-committees for them.