



# Compliance with OSHA's Process Safety Management Performance Based Standard

**An ioMosaic Corporation  
Whitepaper**

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OSHA published the Process Safety Management (PSM) standard in 1992<sup>i</sup>. At that time it was viewed as one of the first performance-based regulations in the US. Previous OSHA regulations were viewed as prescriptive or specification based where all documentation and reporting requirements are included. What made the OSHA PSM standard performance-based was the expectation that each covered facility would need to develop a PSM program and would need to then implement the elements of that program.

A book on environmental, health and safety management describes the difference between specification and performance based standards.

“A specification standard is one where there is no subjectivity. Everything one needs is clearly stated in black and white.” “Performance based standards, on the other hand, leave much of the decision making to the employer.”<sup>iii</sup>

The term “performance based standard” is used quite often in reference to the OSHA PSM standard, but what does this mean? The only specific use of this term is in Section III, Summary and Explanation of the Final Rule, in this comment made by the CMA (The Chemical Manufacturer’s Association):

“Initially CMA would like to commend OSHA on its efforts to craft a comprehensive performance based standard addressing process safety management of highly hazardous chemicals. As CMA has commented in past rulemakings, performance language capitalizes on industry’s ingenuity and capability to effectively reduce hazards as they may be uniquely applied to a particular safety concern.”

In a paper that discusses chemical process safety management within the Department of Energy, the term is also used:

“The PSM Rule is a performance-based standard that defines the elements of an effective chemical process safety program. This encourages innovative solutions to address fundamental safety issues. It does not prescribe how each element is to be implemented 1) due to the impossibility of addressing the diversity of chemical processes that exist, and 2) the performance-based approach developed by the chemical industry had been shown to be effective.”<sup>iii</sup>

Another recent paper lists the OSHA PSM standard as one of a number of performance based standards that have been developed to improve safety. The paper also describes the need for performance based standards as follows:

“They provide flexibility, allow for implementing practical and cost-effective solutions, don’t mandate the *how to* but provide a framework to test alternative protection solutions that increase safety and make business sense. Ultimately, if industry wants to properly manage industrial process risk and reduce it to manageable levels, such standards are a must.”<sup>iv</sup>

Although OSHA does not use the term “performance-based” in the actual text of the PSM standard, the following wording is taken from the preamble to the standard:

“The standard referred to as process safety management, or PSM – emphasizes the application of management controls, rather than specific engineering guidelines, when addressing the risks associated with handling or working near hazardous chemicals. Implementation of process safety management programs and procedures will enable affected establishments to prevent the occurrence, and minimize the consequences, of significant releases of toxic substances, as well as fires, explosions and other types of catastrophic accidents.”<sup>i</sup>

Some specific examples of performance based requirements in the PSM standard can be found in the requirements for the elements process safety information and mechanical integrity.

- Under section 29 CFR 1910.119 (d)(3)(H)(ii): “The employer shall document that equipment complies with recognized and generally accepted good engineering practices.”
- Under section 29 CFR 1910.119 (j)(4)(ii): “Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.”

The term “recognized and generally accepted good engineering practices” or RAGAGEP encompasses a wide body of industry codes and standards. Moreover, RAGAGEP defines the *standard of care* expected of companies by regulatory agencies, government, and society in operating chemical manufacturing (and other) businesses<sup>v</sup>. The American Petroleum Institute Recommended Practice 750 uses a similar term under the Process Safety Information element, except they leave out the word “good” before “engineering practices.”

“The mechanical design should be consistent with the applicable consensus codes and standards in effect at the time the design is prepared or, in the absence of such codes and standards, recognized and generally accepted engineering practices.”<sup>vi</sup>

Shortly after the PSM standard was promulgated, OSHA issued a guidance document for OSHA inspectors that used a program-quality-verification (PQV) approach to inspections<sup>vii</sup>. The PQV approach employed a broad, open-ended inspection strategy and used a more global approach to identify compliance deficiencies. These inspections proved to be highly resource intensive. In 2007 OSHA initiated a Petroleum Refinery Process Safety Management National Emphasis Program (NEP). The NEP approach provided a particular set of

requirements to be addressed during inspections including review of documents, interviews of employees, verification of implementation for specific processes, equipment and procedures. OSHA decided to use the NEP approach to place more emphasis on implementation of programs rather than the documentation. The following is taken from the NEP section D Inspection Process:

“Based on past OSHA inspection history at refineries and large chemical plants, OSHA has typically found that these employers have extensive written documentation related to process safety management, but the implementation of the written documentation has been inadequate. Therefore, CSHOs (Compliance Safety and Health Officers) should focus on implementation of the various PSM elements and ensure that employers do what they have committed to do in their PSM documentation.”<sup>viii</sup>

In the Refinery NEP document (CPL 03-00-004) the term RAGAGEP is defined:

“RAGAGEP – are engineering, operation, or maintenance activities based on established codes, standards, published technical reports, or recommended practices (RP) or similar document. RAGAGEPs detail generally approved ways to perform specific engineering, inspection or mechanical integrity activities, such as fabricating a vessel, inspecting a storage tank, or servicing a relief valve” (see CCPS Guidelines for Mechanical Integrity Systems <sup>vi</sup>).

So despite the fact that many companies and organizations praised OSHA for developing a performance-based standard, ultimately each covered facility wants to know if their program will meet OSHA’s expectations. OSHA has issued hundreds of Letters of Interpretation (LOI) of the PSM standard over the last 17 years in an attempt to clarify the performance-based requirements. It appears that even OSHA has been consistent in what they expect companies to do. Some LOIs in fact have contradicted previous interpretations and those earlier interpretations have been revoked. But in fairness, being a performance-based standard implies that the minimum requirements would be expected to change over time as new RAGAGEPs are developed and existing RAGAGEPs are updated.

Another source of information regarding OSHA expectations is contained in the Refinery NEP document which contains the inspection procedures and set of questions in Appendix A for use by CSHO inspectors. These questions related to various aspects of process safety at refineries, such as equipment, engineering and administrative controls, safe work practices and RAGAGEP in covered processes. The answers to these questions are the basis for determining whether the employer is in compliance with various PSM requirements. Unfortunately the recently published Chemical NEP<sup>ix</sup> does not contain a similar list of questions. Instead OSHA will change the questions used in this NEP as they uncover issues and focus future inspections in those areas.

In the Refinery NEP Inspection Procedures, there is a list of documents that the inspectors are expected to ask from the facility being inspected. One set of documents is the corporate and refinery mechanical integrity (MI) program procedures. In OSHA's Compliance Guidance for this request they state the following:

"The employer is only required to have MI program procedures for the establishment's covered processes (i.e., refinery MI program procedures). However, many employers also have corporate MI program procedures which they may or may not represent as their MI program procedures for PSM-covered process(es). If an employer uses the corporate MI procedures as part of its establishment PSM-covered process MI procedures, then PSM requires the employer to have these corporate procedures developed and implemented as part of its establishment's MI program procedures as per 1910.119(j)(2)." <sup>vii</sup>

Thus OSHA clearly recognizes that corporate standards and procedures can be considered part of a facility PSM program requirement, particularly if the corporate standard is more restrictive and thus would qualify as an in house RAGAGEP. Whether the facilities have their own procedures or follow corporate procedures or both, it is clear that OSHA expects that the facility will comply with these procedures to satisfy PSM requirements. This is further clarified in the CSHO Instructions in Appendix A:

"Consequently, the PSM standard requires the use of a one hazard-several abatement approach to ensure that PSM-related hazards are adequately controlled. Abatement requirements include both management system/program requirements (e.g., the requirement to develop mechanical integrity program procedures which include piping inspection procedures, 1910.119(j)(2)), as well as specific employer action/task abatement requirements (e.g., the mandate to conduct piping inspections, 1910.119(j)(4). In these examples, both the management program procedures and the action/task provisions act together to ensure that there are requirements for the employer to not only conduct piping inspections (action/task), but also that there are provisions requiring that an MI management program procedure is developed and implemented. The example MI program procedure ensures that all piping inspections are not only conducted, but that they are managed in a manner specified by the employer."

OSHA confirms their expectation that a company comply with their written PSM procedures in the type of question listed in Appendix A and the possible violations. Two examples are given below:

- "If the employer has an MI procedure for inspecting pressure vessels, are they inspecting vessels at least as often as that called for in their MI procedure?"

“If no, possible violations include:

1910.119(j)(2) – the employer did not implement pressure vessel inspections per the required inspection frequencies listed in the MI program procedures.”

- “Does the employer have a MI procedure for inspecting pressure vessels for corrosion-under-insulation (CUI), and does the employer inspect pressure vessels for CUI?”

“If no possible violations include:

1910.119(j)(4)(ii) – the employer or “owner/user” did not follow RAGAGEP when it did not develop inspection procedures for CUI, or the employer did not conduct or complete external CUI inspections.”

In the first example, the requirement for developing testing/inspection frequencies is a requirement of the PSM standard. Thus if a RAGAGEP specifies an inspection frequency of every five years and the facility procedure requires annual inspection, the facility procedure would prevail. In the second example, the requirement for CUI inspections is required by RAGAGEP. In both examples failure to develop or follow procedures is a violation of the PSM standard.

As stated previously, RAGAGEPs will change with time as new standards are developed and existing standards are updated. This allows the PSM standard to stay current with RAGAGEPs without necessitating a change in the regulation. In many cases, the OSHA PSM standard has in fact resulted in many RAGAGEPs to be developed or updated. For example, in 1995 the American Petroleum Institute published RP 752 “Management of Hazards Associated with Location of Process Plant Buildings”<sup>x</sup> in response to the industry need for guidance on how to address 1910.119(e)(3)(v) facility siting requirements. In 1996, the Center for Chemical Process Safety published “Guidelines for Evaluation Process Plant Buildings for External Explosion and Fires” which was intended as a how-to implement API RP 752<sup>xi</sup>. In 2003, the second edition of API 752 was published<sup>xii</sup>. In 2007, API published RP 753 “Management of Hazards Associated with Location of Process Plant Portable Buildings”<sup>xiii</sup>. This standard was developed as a result of the fire and explosion at the BP Texas City refinery in 2005. The OSHA Refinery NEP document states that “Placing non-essential employees in trailers too close to the isomerization unit substantially increased the incident’s severity.”

During the OSHA Refinery NEP inspections conducted over the last few years, a number of facilities were given citations regarding facility siting. OSHA had issue with the practice of determining which buildings at a covered facility needed to be included in the facility siting evaluation. OSHA argued that all occupied buildings needed to be evaluated. Both RP 752 and the CCPS Guidelines allowed the use of occupancy criteria (i.e., how many people occupy the building and for what duration). These RAGAGEPs allowed facilities to establish their own occupancy

criteria. As a result RP 752 is now being updated to address OSHA's concerns regarding use of occupancy criteria and the CCPS Guidelines are also being updated based on the third edition of RP 752. They will also address facility siting as it relates to toxic releases.

In conclusion, it requires considerable effort to stay in compliance with a performance based standard like OSHA PSM. It requires a good understanding of the RAGAGEPs that apply to your facility and ensuring that the PSM program procedures incorporate these requirements. It requires constant vigilance to stay up to date on changes to RAGAGEPs since many industry standards are reissued every few years. And it requires an effective compliance audit program to verify that procedures include all applicable RAGAGEPs and that the procedures are being implemented as written.

## References

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- <sup>viii</sup> OSHA CPL 03-00-004 Petroleum Process Safety Management Refinery National Emphasis Program, June 7, 2007.
- <sup>ix</sup> OSHA CPL 02-09-006 PSM Covered Chemical Facilities National Emphasis Program, July 27, 2009.
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