

Before OSHA Comes Knocking ...

DANIEL STEINWAY
BARTON SEITZ
BAKER BOTTS L.L.P.

JUDY PERRY
IOMOSAIC CORP.

RICHARD D. SIEGEL
CONSULTANT TO IOMOSAIC CORP.

The OSHA Process Safety Management National Emphasis Program will soon apply to the chemical industry, targeting compliance with safety standards associated with chemical hazards.

The U.S. Occupational Safety and Health Administration's (OSHA) process safety management (PSM) standard (1) sets requirements for the management of hazards associated with processes that use highly hazardous chemicals (HHC) — *e.g.*, chemicals that are toxic, reactive, flammable or explosive. (Appendix A of the standard contains the complete list of HHCs.)

As part of its overall enforcement activities, OSHA routinely uses national emphasis programs (NEPs) to target establishments or industries that have known or suspected hazardous conditions, such as exposure to lead or silica, the potential for amputations or trench cave-ins, or the presence of combustible dust. In response to recommendations by the U.S. Chemical Safety and Hazard Investigation Board (CSB), in June 2007, OSHA launched a PSM NEP aimed at reducing or eliminating the workplace hazards associated with the catastrophic release of HHCs at petroleum refineries (2). Over the past year and a half, the agency has conducted comprehensive regulatory-compliance inspections at dozens of refineries throughout the U.S., and it expects to be finished inspecting all 81 refineries under federal jurisdiction by the end of 2009.

More recently, the agency announced its plan to expand the PSM NEP to include the chemical industry. This initiative will target chemical facilities' compliance and implementation efforts related to PSM and other workplace-safety standards associated with chemical hazards. Although OSHA has not yet officially launched the program, it is in the process of developing the protocols and procedures needed to roll out the program early this year.

In the meantime, chemical plants can begin to prepare for these anticipated inspections. This article outlines some of

the lessons learned from the refinery inspections, offers insights into the PSM standard elements and compliance issues that OSHA inspectors will likely target at chemical plants, and provides guidance on how facilities can prepare for the inevitable visits.

The refinery NEP to date

OSHA has already identified numerous violations and issued a significant number of citations. The results of the first 20 refinery inspections (Table 1) demonstrate that OSHA has adopted a very aggressive enforcement stance and is seeking to impose significant civil penalties and related sanctions for noncompliance. This is expected to continue into 2009.

Enforcement emphasis. Initially, OSHA stated that its PSM NEP inspections would focus on implementation (not documentation) to ensure that substantive workplace hazards are being appropriately addressed. This would have represented a departure from OSHA's oft-perceived focus on "paperwork" violations.

However, based on the first-year inspections, it appears that the compliance officers are, in fact, focusing on both implementation and documentation (Table 2). Furthermore, the OSHA inspectors are typically reviewing every element of the complete PSM program.

In addition, the OSHA compliance officers are going "off-script" and expanding the inspections beyond PSM requirements. For example, at two facilities, citations associated with as many as 46 different standards were issued. The most common violations related to the lockout/tagout (29 CFR 1910.147), hazard communication (1910.1200), confined-space entry (1910.146), and hazardous waste

operations and emergency response (HAZWOPER; 1910.120) regulations. Other citations dealt with basic, fundamental OSHA requirements associated with personal protective equipment (1910.132–138), walking/working surfaces (1910.21–30), and the classification, installation and functioning of electrical equipment (1910.301–308).

Additional information regarding the refinery NEP program can be obtained from OSHA's website, www.osha.gov/pls/imis/InspectionNr.html. (Violation-related data are available for only certain facilities/inspections at the present time, but additional information is being uploaded periodically.)

OSHA's apparent continued focus on documentation (and not solely implementation) of relevant standards is demonstrated by the large number of citations related to operating procedures. Furthermore, OSHA compliance officers are seeking to validate whether the operating procedures have been implemented at each individual step specified in the relevant OSHA compliance guidance. There is a particular emphasis on emergency shutdown and emergency operating procedures. Section (f)(1)(i)(d) of the PSM standard covers "emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown (ESP) is executed in a safe and timely manner." A detail that is often overlooked when these procedures are developed is the clear identification of responsibility for shutdown execution in the ESP documentation.

With regard to implementation, compliance officers have been targeting the follow-up portion of several PSM elements, including obligations related to the closure of process hazard analysis (PHA) findings and incident investigation corrective actions. Other implementation areas of focus include execution of inspections on process equipment (for which a willful-violation citation was issued), and updated process and instrumentation diagrams (P&IDs).

Violations were also frequently issued for failure to provide: the relief system design basis (d)(3)(i)(d), safe work practices for employees and contractors (f)(4), written procedures related to employee participation (c)(1), and written procedures associated with equipment inspections (j)(2).

Penalties. The fines assessed have typically been in the range of \$1,500–\$5,000 per citation. Willful violations, which involve an alleged

blatant disregard of or indifference to an obvious safety hazard, commonly incurred penalties of \$49,500.

After OSHA inspected two of its refineries, one company was issued proposed penalties of \$357,750, based on allegations of three willful and 58 serious safety violations. The willful violations related to electrical equipment in a process area, inadequate facility siting (*i.e.*, employees were located in close proximity to a process area), and failure to inspect and test process vessels.

Getting ready for the chemical industry NEP

Companies engaged in the manufacturing, processing, and/or distribution of HHCs can apply the learnings from

Table 1. Refinery inspection results for the first 20 facilities.*

Total Number of Citations Issued to Refinery Employers	516†
Total PSM Citations Issued	361
Significant Enforcement Cases	9
Average Number of Citations per NEP Inspection	>23
Number of Willful Violations	8
Number of Serious Violations	459
Number of Repeat Violations	8
Number of Unclassified Violations	14
Number of Other Violations	15
Total Penalties Assessed	\$2,709,000
*As of Nov. 1, 2008.	
†At two facilities, citations were issued for violations of as many as 46 different standards (in addition to PSM).	
Source: (3).	

Table 2. The most commonly cited PSM elements during refinery NEP inspections.

PSM Element	Section of PSM Standard, 1910.119	Number of Citations
Operating Procedures	(f)(1)	49
Process Safety Information (PSI) Pertaining to Equipment	(d)(3)	47
Process Hazard Analysis (PHA) Criteria	(e)(3)	40
Mechanical Integrity (MI) Inspection and Testing	(j)(4)	32
PHA Recommendation Follow-Up	(e)(5)	16
MI — Operating Deficient Equipment	(j)(5)	16
Management of Change (MOC)	(l)(1)	15
Source: (4).		

the refinery NEP to prepare for the upcoming chemical industry NEP. Although detailed information is not yet available, OSHA has indicated that it intends to conduct more inspections of shorter duration within the chemical industry. Its plan calls for targeting locations designated as Program 3 facilities under the U.S. Environmental Protection Agency's (EPA) risk management program (RMP). Program 3 facilities are those with complex

processes subject to OSHA's PSM standards, or those with Standard Industrial Classification (SIC; www.floridadisaster.org/cps/arprmp/DEFINATI1.htm) or North American Industry Classification System (NAICS; www.ntis.gov/product/naics.htm) codes associated with historically high accident rates or those complex processes currently subject to OSHA's requirements.

OSHA is expected to emphasize chemical reactivity hazards as part of the upcoming NEP. In informal discussions, the agency has suggested that the chemical reactivity portion of process safety information (PSI) will be a key area of interest for inspectors.

Compliance will likely be evaluated by determining whether the organization has a system in place for identifying chemical reactivity hazards and that it has prepared and maintained sufficient documentation of that system. In particular, inspectors will want to see that the plant has established safe operating limits associated with the process chemistry and the related energy balances.

Compliance officers will also seek documentation of stability information for chemical storage. In its investigation of chemical reactivity hazards (5), the CSB found that storage facilities experienced the second-highest number of reactive chemical incidents, second only to reactors.

As an initial step, a chemical facility should review its PSM compliance status and the findings of its most recent PSM compliance audit (conducted every three years). It should ensure that appropriate corrective measures have been implemented and are being tracked or otherwise documented as "closed." OSHA personnel will likely expect chemical facilities to have learned from the refining NEP experience and implemented robust, systematic methods of maintaining full compliance with the PSM standard. Companies should, therefore, ensure that their PSM and related programs are being managed as effectively as possible, given prevailing fiscal, personnel and resource constraints.

Preparing for and managing inspections

In order to adequately prepare for any type of regulatory inspections, facilities

The Chemical Industry Top Ten List

This brief list of high-priority items is based on a thorough review of publicly available information and is intended to help facility managers prepare for the chemical industry national emphasis program. Each facility and each individual PSM coordinator has the best sense of existing gaps at a particular facility, but this list can serve as a good starting point.

1. Review operating procedures to ensure that each phase of operation is covered, as outlined in the PSM standard.
 - a. Validate that emergency shutdown procedures (ESPs) clearly outline when they should be initiated and who (*i.e.*, what position or job title) is assigned to specific shutdown tasks.
 - b. Validate that temporary operations are included in the operating procedures.
2. Review the available process safety information (PSI) for each process. Ensure that the information is being properly filed and managed, and is readily available.
 - a. Ensure that piping and instrumentation diagrams (P&IDs) are being red-lined and are current to existing operations.
 - b. Document relief system design and the design basis, and ensure that it addresses reactivity concerns.
 - c. Ensure that documentation indicates the equipment's compliance with recognized and generally accepted good engineering practices (RAGAGEPs).
 - d. Ensure that electrical classifications are documented and well understood.
 - e. Document evaluations of chemical reactivity hazards.
3. Review process hazard analysis (PHA) reports in detail.
 - a. Validate that the 5-yr revalidation has occurred on time.
 - b. Validate that closure of action items has occurred and that closure is documented.
 - c. Validate that human factors and facility siting are included in the PHA report.
 - d. Ensure that facility siting is based on current design codes and standards.
4. Review the implementation and documentation of the mechanical integrity program.
 - a. Validate that written procedures related to the ongoing integrity of the process, based on industry standards (RAGAGEPs), are available.
 - b. Validate that inspections are occurring, and that the inspection frequency is based on industry standards (RAGAGEPs).
 - c. Correct any deficiencies in equipment, *i.e.*, operation outside of safe operating limits, before further use (or in an otherwise safe and timely manner).
5. Monitor that incident investigations are being done correctly and that resulting action items are addressed.
6. Make available a written employee participation plan.
7. Review OSHA compliance standards related to electrical equipment (1910.302–308) and conduct a general site inspection of electrical equipment in hazardous areas.
8. Validate that personal protective equipment (PPE) procedures and current training documentation are in place and are being followed by employees.
9. Validate that safe work practices are in good order (*e.g.*, for lockout/tagout, confined-space entry, line breaking) and being followed by employees and contractors.
10. Validate that the plant's management of change (MOC) procedure is current. Audit areas of recent changes to validate proper implementation.

should adopt an effective inspection protocol that includes, at a minimum, the following key elements:

Prepare and train facility personnel. A critical step is the adequate planning, preparation, and training of personnel. Those involved in coordinating the inspection should receive instruction on how to deal with the inspectors. An important part of preparation is the review of records related to required employee training. Ensure that they are readily available and well organized. Many inspections include requests from the inspectors for employee training records.

Manage the inspection effectively. Establish specific procedures for planning for and responding to inspections. Establish an inspection team to serve as escorts for the inspectors, and conduct mock inspections to familiarize them (and other employees) with the procedures. These procedures should cover such topics as verifying the inspector's credentials and inspection authority, conducting the initial introductions and pre-inspection meeting, interacting with the inspector during the inspection, responding to requests for photographs, copies of files, and/or employee interviews, and what to do if the inspectors go off-script or desire to broaden the inspection.

Debrief the inspector. Before the inspector leaves the site, the inspection team should conduct a post-inspection meeting with him or her. This may provide an opportunity to discuss or clarify potential violations and convince the inspector that a field citation is not warranted.

Prepare a record of the inspection. It is essential to prepare and maintain accurate records of all activities associated with the inspection. Include a list of the areas inspected and employees interviewed, a summary of all discussions, copies of any photographs taken by the inspector, and an outline of all findings or observations noted by the inspector.

Take necessary follow-up and corrective actions. Re-

spond promptly to all of the findings of the inspection. Legal counsel should be consulted if it is necessary to prepare a response to any citations or compliance issues. Document all actions taken.

These are just a few of the factors that should be considered when planning for regulatory inspections. The box on the previous page provides practical insights into the anticipated OSHA NEP for the chemical industry. This guidance is based on published reports and presentations by OSHA personnel during the past year. Additional information can be found in the detailed compliance directive for the refinery NEP (2) on the OSHA website.

CEP

DANIEL STEINWAY is a partner in the environmental, health and safety (EH&S) practice group of the law firm of Baker Botts L.L.P. (Washington, DC), where he advises major corporations and trade organizations on all facets of civil and criminal environmental law. He also provides representation in litigation covered by federal and state statutes and common law causes of action, and he has managed the defense of multiparty litigations involving environmental and industrial hygiene issues and represented corporate defendants in a wide range of civil and criminal EH&S enforcement at both the federal and state levels. Steinway earned a BSE in engineering science from the Univ. of Michigan and a JD from George Washington Univ.

BARTON SEITZ is a partner in Baker Botts and a member of the firm's EH&S practice group. He handles a wide range of EH&S matters, including regulatory counseling, complex litigation, and transactions. His particular expertise is in advising corporate and public sector clients regarding complex compliance and enforcement issues arising under federal statutes such as the Resource Conservation and Recovery Act (RCRA), Clean Water Act, Occupational Safety and Health Act, Clean Air Act, Toxic Substances Control Act (TSCA), and the Emergency Planning and Community Right-to-Know Act (EPCRA, or Superfund). Seitz received a BA in economics and history from the College of William and Mary and a JD from George Washington Univ.

JUDY PERRY is a partner at ioMosaic Corp. (perry.j.nh@iomosaic.com) with more than 20 years of experience in process safety and loss control management in the chemical industry, including 13 years at a large pharmaceutical manufacturing complex. Her expertise in process safety management includes onsite OSHA-compliance inspections, process hazard analysis leadership, process safety engineering design and design standards, identification of chemical reactivity hazards, incident investigation, and safeguards for the safe handling of dusts. She recently taught a National Society of Safety Engineers course entitled "A Process Engineer's Role in Preventing Catastrophe." She is currently assisting with preparations of the PSM NEP, and with others at ioMosaic is assisting facilities inspected during the refinery NEP, with an emphasis on relief system design and design basis and facility siting. Perry has a BS in chemical engineering from the Univ. of Missouri – Rolla and MS in environmental sciences from the Univ. of Illinois – Edwardsville.

RICHARD D. SIEGEL, is an environmental consultant with 40 years of experience in risk management for chemical, petrochemical, pharmaceutical and government clients. He is currently assisting ioMosaic with PSM business-development activities. He is also president of R & B Consulting Services, a firm that provides marketing and business-development support to EH&S consulting and engineering firms. He was involved in the establishment of AIChE's Center for Chemical Process Safety (CCPS) as chair of its Government Relations Committee, and in the development of CCPS' guidelines on site vulnerability analysis (SVA), which were prepared to assist the chemical industry in evaluating potential risk and consequences and in developing risk-management practices, in light of the Sept. 11, 2001 attacks. He received his BS and MS degrees from Tufts Univ. and his PhD from Lehigh Univ. all in chemical engineering. He has been an active member of AIChE and a leader of the Environmental and Management Divisions.

Literature Cited

1. **U.S. Occupational Safety and Health Administration**, "Process Safety Management of Highly Hazardous Chemicals," 29 CFR 1910.119, www.osha.gov/SLTC/processsafetymanagement/index.html.
2. **U.S. Occupational Safety and Health Administration**, "Petroleum Refinery Process Safety Management National Emphasis Program," Directive CPL 03-00-004, www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=3589 (June 6, 2007).
3. **Marshall, M.**, "NEP Data and Findings," OSHA, Washington, DC (2008).
4. **Yoksas, G.**, "OSHA's Refinery NEP Perspective — One Year Later and Upcoming Chemical Safety Enforcement Initiative," Presented at AIChE Midwest Regional Conference, Chicago, IL (2008).
5. **U.S. Chemical Safety and Hazard Investigation Board**, "Improving Reactive Hazard Management," Report 2001-01-H, CSB, Washington, DC (Oct. 2002).