OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION
DEPARTMENT OF CONSUMER AND BUSINESS SERVICES

PROGRAM DIRECTIVE

Program Directive: A-177
Issued: April 5, 1993
Revised: September 12, 2018

SUBJECT: National Emphasis Program (NEP): Process Safety Management of Highly Hazardous Chemicals

PURPOSE: This program directive establishes uniform policies, procedures, standard clarifications, and compliance guidance for enforcement of the standard for Process Safety Management (PSM) of Highly Hazardous Chemicals, 1910.119 and amendments to the standard for Explosives and Blasting Agents, 1910.109.

SCOPE: This directive applies to all Oregon OSHA.

APPENDICES:

A: PSM Audit Guidelines

B: Clarifications and Interpretations of the PSM Standard

C: Recommended Guidelines for PSM Inspection Preparation (Non-mandatory)

D: Oregon OSHA Policy Document: October 15, 2010 letter to large quantity suppliers of agricultural anhydrous ammonia.

E: References for compliance with the PSM Standard.

F: May 11, 2016, Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of RAGAGEP in Process Safety Management Enforcement.

G: July 18, 2016, Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of Process Safety Management of Highly Hazardous Chemicals and Covered Concentrations of Listed Appendix A Chemicals.

H: April 30, 2018, Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of PSM Retail Exemption Enforcement Policy

ACTION: All compliance and enforcement activities conducted by Oregon OSHA related to the PSM standard must adhere to the guidelines of this program directive.

BACKGROUND: In recent years, a number of catastrophic accidents in the chemical industry have drawn attention to the safety of processes involving highly hazardous chemicals. OSHA determined that employees continue to be exposed in their workplaces to releases of highly hazardous chemicals which may be toxic, reactive, flammable, or explosive.

The requirements of the PSM standard are intended to eliminate or mitigate the consequences of such releases. The standard emphasizes the application of management controls when addressing the risks associated with handling or working near hazardous chemicals.

In addition, the PSM standard was developed to fulfill OSHA's obligation under the Clean Air Act Amendments (CAAA) of 1990, section 304(a). The final PSM standard is consistent with the mandate of the CAAA.

It is anticipated that joint inspection activities related to the PSM standard will arise between Oregon OSHA, federal OSHA, the Environmental Protection Agency, and the Chemical Safety and Hazard Investigation Board, as mandated by the CAAA.

ENFORCEMENT ACTIVITY RELATED TO THE PSM STANDARD:

The 1910.119 standard has broad applicability to potentially hazardous processes that may exist in a wide variety of industries. Accordingly, enforcement activities related to the PSM standard either to determine if an employer is covered by the standard or to assess the employer's compliance with it may take place in any of the inspection types described below.

NOTE: Because the Division 4 rules do not reference the PSM standard, the PSM rules do not apply to agricultural employers. (See *OAR 437-004-0002, Scope*; and *437-004-0003, Exclusive Coverage*.)

TYPES OF INSPECTIONS: The following guidelines apply to PSM-related compliance activity:

A. **Programmed PSM Inspections:** Will be initiated from one of the scheduling lists (Ammonia, Chlorine, Formaldehyde or Miscellaneous)

B. **Unprogrammed PSM-Related Inspections:** If inspection activity

related to the PSM standard is not programmed, a determination must be made as to whether the establishment is covered by 1910.119.

If a formal complaint or referral relating to the PSM standard is received at a company with a PSM-covered process, investigate the complaint or referral and use the following guidance:

1. Screen all programs required by the PSM standard for obvious violations.
2. Consider a referral for a PSM inspection if major deficiencies are indicated and document it in the case file.
3. Follow the general procedures outlined in *Program Directive A-219. Inspection Criteria: Complaint Policies and Procedures* and the Field Inspection Reference Manual (FIRM). Because the elements of a PSM inspection are often interrelated, a complaint concerning one PSM element typically leads to the evaluation of multiple elements or a full PSM inspection.

C. Responses to Accidents and Catastrophes. Responses to accidents and catastrophes involving PSMs must follow the guidelines contained in Chapter 5 of the FIRM in addition to the guidelines of this program directive. If the employer has a PSM-covered process and major deficiencies are indicated, consider a referral for a PSM inspection.

INSPECTION RESOURCES:

Appropriate levels of staff training and preparation are essential for compliance activities relating to the PSM standard. Inspections using this NEP may be conducted by either a single Oregon OSHA employee or a team. At least one member of the team or the Oregon OSHA employee must be trained in PSM. PSM inspections are research-intensive and require careful planning and coordination. The recommendations included as Appendix A of this program directive may be used as a guide for such planning.

A. **PSM Team Members**. Only trained compliance safety and health officers (CSHOs) with knowledge of PSM will be assigned to lead a PSM inspection under this standard.

1. The lead CSHO must have completed one or more courses such as:

- OSHA Training Institute's (OTI) Course 3300, Safety and Health in the Chemical Processing Industries.
- Course 3400, Hazard Analysis in the Chemical Processing Industries.
- Course 3410, Advanced Process Safety Management.

- Course 3430, Advanced PSM in the Chemical Industries, or a specialized course on ammonia refrigeration.

2. The lead CSHO must have prior experience including one of the following:

   - Accident investigations in chemical, petrochemical or refinery plants involving fires, explosions, or toxic chemical releases.
   - Previous chemical inspections involving process safety management evaluations, or previous chemical industry employment.
   - Participation in a PSM inspection of process-specific hazards and systems, for example, an ammonia refrigeration facility or chlorine (dioxide) use in water/wastewater treatment plants.

B. **CSHOs with Less Training.** Complaint and other unprogrammed inspections pertaining to some sections of the standard may be conducted by CSHOs who do not have the training an experience described above, but who are experienced in evaluating other programmatic standards such as hazard communication and lockout/tag out and in evaluating respirator programs.

1. The following sections of 1910.119 may be appropriately evaluated by such CSHO:
   - Employee participation
   - Training
   - Contractors
   - Hot work permits
   - Incident investigation
   - Emergency planning and response

2. The CSHO must make full use of Oregon OSHA central office resources when deciding on compliance or noncompliance.
3. To the extent possible, managers will attempt to use CSHOs with experience and training in the chemical industry to perform such unprogrammed inspections.

PSM INSPECTION SCHEDULING:

Due to the resource-intensive nature of inspections for compliance with the PSM standard, Oregon OSHA will be able to perform only a limited number of PSM inspections each year. A special targeting and scheduling system is therefore necessary to maximize the effective use of inspection resources.

Targeting. Oregon OSHA wishes to make the most effective use of its limited resources, and therefore annual data gathered by the Oregon Office of State Fire Marshal (OSFM) Hazardous Substance Information System (HSIS), past inspection data and local knowledge of industries within the associated North American Classification System (NAICS) codes will be used to generate scheduling lists. The compiled data base will be sorted to generate a list consisting of the following: employers who reported having chemicals stored at their facilities in excess of the PSM Threshold Quantities (PSM-TQ) and employers that are operating facilities that fall within known NAICS codes that commonly have chemicals stored at their facilities in excess of the PSM-TQ.

The majority of PSM employers have threshold quantities of ammonia, chlorine, or formaldehyde. Oregon OSHA will divide the list into four groups: ammonia, chlorine, formaldehyde, and miscellaneous. Each of these lists will be randomized and ranked. The lists will generally be completed in order or for best use of available resources. Lists will be updated when deemed necessary, but at least every three years. (See deletion criteria, below).

A. **Deletion Criteria**. An establishment will be deleted from the list if it is one of the following:

1. Has received a PSM inspection within the current or the preceding five calendar years.
2. Is included in a corporate settlement agreement requiring appropriate management systems for process safety.
3. Is a VPP/SHARP participant.
4. Is a corporate office/headquarters and is not engaged in actual production or physical research operations.
5. Is not covered because of exclusions in the PSM standard.

NOTE: Determination for deletion will initially be made at the central office when the list is prepared or subsequently at the field office when based on local knowledge (for example, recent inspections or field office screening).

SCOPE OF A PSM INSPECTION:

PSM inspections initiated under this directive will follow the procedures outlined.

Where PSM-covered chemicals (See 1910.119, Appendix A) are encountered through scheduled, complaint or referral inspections, the CSHO will assess, in conjunction with their manager, the appropriate means for addressing PSM issues as described within this directive. A separate inspection may be conducted based on the size and complexity of the PSM issues.

Based on a history of inspections at refineries and large chemical plants, OSHA has found that employers may have an extensive written PSM program, but insufficient program implementation. Therefore, CSHOs should verify the implementation of PSM elements to ensure that the employer's actual program is consistent with their written program.

CSHOs must inspect both the host employer and contract employers, if any.

CSHOs must review the employer's history of Oregon OSHA inspections and any abatement verification submitted for citations resulting from those inspections.

PSM INSPECTION PROCEDURES:

CSHOs must follow the procedures given in the FIRM, Chapter 3, except as modified in the following sections: (Also see Appendix A, B, and C of this directive.)

A. **Opening Conference**. Include, when appropriate, the facility safety and health director, process safety manager, or other person capable of explaining the company's process safety management program in the opening conference.

1. Confirm that the facility has a PSM-covered process.

    a. Request a list of the chemicals on site and their respective maximum intended inventories. Review the list of chemicals and quantities, and determine if there are highly hazardous chemicals listed in 1910.119 Appendix A, or flammable liquids or gases at or above the specified threshold quantity. CSHOs may ask questions, conduct interviews, or conduct a walk-around to confirm the information on the list of chemicals and maximum intended inventories. If you determine that there are no highly hazardous chemicals, flammable liquids, or flammable gases present in sufficient quantities and the facility is not manufacturing explosives or pyrotechnics as defined in 1910.109, then, document the findings and end the inspection.

b. Confirm that the facility is not an exempt establishment: a retail facility, an oil or gas well drilling or servicing operation, or a normally unoccupied remote facility [1910.119(a)(2).] If it is exempt, document the findings. [See the policy memo in Appendix D of this directive: Oregon OSHA does not exempt Farm Supply Merchant Wholesalers – NAICS 424910 – with at least 10,000 pounds (or 1,943 gallons) of anhydrous ammonia onsite. They are not considered retail facilities and are therefore covered by the PSM rules.]

c. Determine if other exemptions apply. According to 1910.119(a)(ii), a process could be exempt if the employer can demonstrate that covered chemicals are one of the following:

   i. Hydrocarbon fuels used solely for workplace consumption as a fuel (for example, propane used for comfort heating, gasoline for vehicle refueling), if these fuels are not a part of a process containing another highly hazardous chemical covered by the standard.

   ii. Flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without the benefit of chilling or refrigeration.

   If the employer believes that the process is exempt, they must provide documentation or other information that demonstrates the reason for exemption.

d. CSHOs may ask questions, conduct interviews, or conduct a walk-around to confirm that the exemption applies. If the exemption is confirmed, document the findings and end the inspection.

2. During the opening conference, CSHOs must familiarize themselves with the establishment's emergency response procedures and emergency alarms.

3. CSHOs must also request that the management representatives provide them with a reasonably detailed overview of the chemical (and, where applicable, explosives) process or manufacturing operations at the facility, including block flow or process flow diagrams indicating chemicals and processes involved.

B. **PSM Overview**. Prior to beginning the walk-around inspection, request an explanation of the company's PSM program including, at a minimum:

1. How the elements of the standard are implemented.

2. Personnel designated as responsible for implementation of the various elements of the standard.
3. A description of company records used to verify compliance with the standard.

C. **Initial walk-around**. After the overview of the company's PSM program, the inspection may begin with a brief walk-around inspection of those portions of the facility within the scope of the standard. Additional walk-around activity may be necessary after selection of the process units. The purpose of the initial walk-around is to:

1. Get a basic overview of the facility operations;
2. Observe potential hazards such as pipework at risk of impact, corroded or leaking equipment, unit or control room siting, and location of relief devices; and
3. Solicit input from employee representatives concerning potential PSM program deficiencies.

D. **Personal Protective Equipment (PPE).** In addition to normal inspection protective equipment, CSHOs will: be provided with flame retardant coveralls for protection from flash fires and with NIOSH approved emergency escape respirators for use during any emergency conditions if needed, as outlined below. PPE must be appropriate to the environment at the workplace. Special equipment will be necessary in environments containing explosive materials.

1. Wear flame-retardant coveralls in all areas of the plant where there is potential for flash fires and as may be required by company policy.

   NOTE: Clothing made of synthetic fabrics such as polyester should not be worn underneath flame-retardant coveralls.
2. Carry emergency escape respirators, when necessary, during the walk-around portions of the inspection. CSHO conducting these inspections must have received proper training in the use of emergency escape respirators.
3. Where the devices are necessary, the CSHO have the appropriate alert-monitor approved for the environment where it will be used – for Hydrogen Cyanide [HCN] or Chlorine [Cl2], for example.
4. The CSHO must ensure that any still cameras or video cameras used on these inspections are intrinsically safe for use in the process areas being inspected.

NOTE: Outside of classified areas, CSHOs may use video cameras, non-intrinsically safe cameras equipped with a telephoto lens, or still cameras without batteries or a flash. If the employer allows the use of non-intrinsically safe cameras in hazardous (classified) locations, CSHOs may use it when the employer issues a hot work permit for the use of the camera; and continuous combustible gas metering, using a meter which has been calibrated, prior to use, is provided in the areas where the camera will be used.

5. CSHOs must ensure that all electronic devices such as cell phones and PDAs are turned off before entering any hazardous (classified) locations.

E. **Documentation to be Requested ─ General and Process-Related**. At the conclusion of the opening conference, the CSHO must request access to or copies of the documents listed below. Initially, to expedite the inspection process, only access to documents should be requested. During the inspection, as potential violations of the standard are observed, copies of the written documentation described below must be requested to substantiate citations.

Compliance Guidance: The list below is not intended to limit the type and number of documents to be requested. The Oregon OSHA inspection team may request additional documents as necessary.

The list represents documents typically compiled by employers with PSM-covered processes at their facilities. The PSM standard requires the employer to maintain some, but not all, of these documents. Therefore, the employer may not have all of these documents. In some cases, documentation may have been produced by a consultant or contractor.

1. OSHA 300 Logs for the past 3 years for both the employer and all process-related contractor employers.
2. Employer's written plan of action for implementing employee participation.
3. Written process safety information for the units selected, if available, such as flow diagrams, piping and instrumentation diagrams (P&IDs), and process narrative descriptions.

   NOTE:The employer’s schedule for compiling process safety information must be consistent with the employer's schedule for conducting the process hazard analyses (PHA).

4. Documented priority order and rationale for conducting process hazard analyses, team members; actions to promptly address findings; written schedules for actions to be completed; documentation of resolution of findings; documentation verifying communication to appropriate personnel; and 5-year re-validation of original PHA required by the standard.
5. Written operating procedures for safely conducting activities in each selected unit; annual certification that operating procedures are current and accurate; written procedures describing safe work practices for potentially hazardous operations, for example: lockout/ tag out; confined space entry; lifting equipment over process lines; capping over ended valves; opening process equipment or piping; excavation; and control over entrance into a facility by maintenance personnel, laboratory personnel, or other support personnel.
6. Training records for initial and refresher training for all employees in the selected units whose duties involve operating a process; methods for determining the content of the training; methods for determining frequency of refresher training; certification of required knowledge, skills, and abilities to safely perform job for employees already involved in operating a process, who have not received initial training, and training material.
7. Pre-startup safety review for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information; documentation of employee training.
8. Written procedures and schedules to maintain the ongoing integrity of process equipment; the relevant portions of applicable manufacturers' instructions, codes, and standards; and inspection and tests performed on process equipment in the units selected. See in APPENDIX F: May 11, 2016, Federal OSHA Memorandum on the Subject of RAGAGEP in Process Safety Management Enforcement.
9. Hot work permit program and active permits issued for the units selected.
10. Written procedures to manage change to process chemicals, technology, equipment and procedures; and changes to facilities that affect a covered process.
11. Incident investigation reports for the units selected, resolutions and corrective actions.
12. Written emergency action plan including procedures for handling small releases and evidence of compliance with 1910.120(a), (p), and (q), where applicable.

13. The two most recent compliance audit reports, appropriate responses to each of the findings, and verifications that deficiencies have been corrected.

F. **Documentation to be Requested – Contractor-related**. Request the following information relating to contractor compliance:

1. Documentation from host employer:
    a. Information relating to contract employers' safety performance and programs.
    b. Methods of informing contract employers of known potential hazards related to contractor's work and the process and applicable provisions of the emergency action plan.
    c. Safe work practices to control the entrance, presence and exit of contract employers and contract employees in covered process areas.
    d. Evaluation of contractor employer performance in fulfilling responsibilities required by the standard.
    e. Contract employee injury and illness logs related to work in process areas.
    f. A list of unique hazards found in the workplace that are presented by contractors' work or hazards that have been reported to the employer.
2. Documentation from Contract Employers:
    a. Records showing that employees receive training in and understand safe work practices related to the process on or near which they will be working.
    b. Known potential fire, explosion or toxic release hazards related to job, and applicable provisions of emergency action plan.
    c. A list of unique hazards presented by contractors' work or hazards found in the workplace that have been reported to the employer.

G. **Selection of Process**. The team leader will select one or more processes to evaluate compliance with the standard. This selection will be based on the factors listed below, and must be documented in the case file:

1. Factors observed during the walk-around.
2. Incident reports and other history.
3. Company priorities for or completed process hazard analyses (PHA).

4. Age of the process unit.
5. Nature and quantity of chemicals involved.
6. Employee representative input.
7. Current hot work, equipment replacement, or other maintenance activities.
8. Number of employees present.

Oregon OSHA is one of several state agencies who have entered into a Memorandum of Agreement (MOA) with EPA Region 10, Risk Management Program (RMP), for describing how Section 112(r) of the Clean Air Act Amendments will be implemented in Oregon. It describes duties/responsibilities for compliance, enforcement, information sharing, and outreach opportunities on risk management plans. (See Appendix E for this reference).

COMPLIANCE GUIDELINES FOR SPECIFIC PROVISIONS OF 1910.119:

Guidelines for assessing compliance with the provisions of the PSM standard are provided in Appendix A and B of this program directive.

A. Use the guidance contained in Appendix A and B during all enforcement activities related to the PSM standard. Appendix A will normally be the first point of reference in interpreting 1910.119.

B. Non-mandatory, planning and procedural suggestions are provided in Appendix C of this directive; Appendix D is an Oregon-specific interpretation; general references are provided in Appendix E; and Appendix F provides a copy of the federal OSHA memorandum on using RAGAGEP in enforcement.

CITATIONS: Citations for violations of the PSM standard must be issued in accordance with the FIRM with the following additional directions:

Classification. The requirements of the PSM standard are intended to eliminate or mitigate the consequences of releases of highly hazardous chemicals. The provisions of the standard present closely interrelated requirements, emphasizing the application of management controls when addressing the risks associated with handling or working near hazardous chemicals.

- Any violation of the PSM standard, therefore, is a condition which could result in death or serious physical harm to employees.
- Accordingly, violations of the PSM standard will normally not be classified as “other-than-serious.”

- The determination of the probability and severity of any violation must follow the guidelines in the FIRM and the rules in Division 1. Discuss specific questions about each case with your manager.

RECORDING IN OTIS:

The instructions that follow are for inspections under this NEP.

A. All enforcement activities-inspections, complaints, accidents, referrals conducted under this NEP must be coded with the NEP code "NEP-ELIMINATE HAZARDS FROM RELEASE OF HAZCHEMICALS" entered in the appropriate NEP field/item # on the respective forms.

B. All inspections of contractors initiated as a result of a Programmed inspection of the host employer will be identified as Program Related.

C. For OTIS, the inspection for the contractor must indicate "CHEMNEP" in the emphasis area and t he Optional Information must indicate: Type = N; ID = 01; and Value = (the inspection number of the host employer).

D. Consultation staff should enter the "Process Safety Management" field emphasis code in the ORCA System when addressing an emphasis topic with employers.

EFFECTIVE DATE:

This directive is effective immediately and will remain in effect until cancelled or superseded. We anticipate that this directive will be updated if federal OSHA issues any additional interpretive memorandums or any subsequent, delayed enforcement dates.

History: Issued 4-5-1993 Revised 4-27-2003, 11-14-2014, 6-15-2015, 5-18-2016, 6-06-2017, and 9-12-2018.

APPENDIX A

PSM AUDIT GUIDELINES

Purpose
CSHOs investigating an employer's compliance with the PSM standard must use the audit guidelines in Appendix A in conjunction with *Appendix B, Clarifications and Interpretations of the PSM Standard*, as the primary source of compliance guidance on 1910.119.

Basic Audit Information
In order to gather the information needed to audit the program, the CSHO must answer the following questions for each program element:

Who? What? When? Where? Why? and How?

1. **Who** are the officials responsible for developing and implementing each of the program elements?
2. **What** are the requirements and the contents of each program element?
3. **When** are the required actions for each element completed and when are they required to be completed?
4. **Where** have actions been implemented or changed?
5. **Why** have the implementation decisions and priorities been made as recorded in the PSM documentation?
6. **How** is the program implemented and how is the program's effectiveness evaluated and improved (such as monitoring performance, follow-up, and closure of outstanding items)?

Interrelationship of Elements
An essential part of verifying program implementation is to audit the flow of information and activities among the elements. When information in one element is changed or when action takes place in one element that affects other elements, the CSHO will review a sample of the related elements to see if the appropriate changes and follow-up actions have taken place.

The following example demonstrates the interrelationship among the elements:

> During a routine inspection of equipment **(Mechanical Integrity)**, the maintenance worker discovers a valve that no longer meets the applicable code and must be changed. Because the type of valve is no longer made, a different type of valve must be selected and installed **(Management of Change)**. The type of valve selected may mandate different steps for the operators **(Operating Procedures)** who will require training and verification in the new procedures **(Training)**. The rationale for selecting the type of valve must be made available for review by employees and their representatives **(Employee Participation)**.

When the new valve is installed by the supplier **(Contractors)**, it will involve shutting down part of the process **(Pre-startup Safety Review)** as well as brazing some of the lines **(Hot Work Permit)**. The employer must review the response plan **(Emergency Planning)** to ensure that procedures are adequate for the installation hazards.

Although **Management of Change** provisions cover interim changes, after the new valve is in place the **Process Safety Information** will have to be updated before the **Process Hazard Analysis** is updated or revalidated, to account for potential hazards associated with the new equipment. Also, inspection and maintenance procedures and training will need to be updated **(Mechanical Integrity)**.

In summary, 11 PSM elements can be affected by changing one valve. A CSHO would check a representative number of these 11 elements to confirm that the required follow-up activities have been implemented for the new valve.

Three key elements must be routinely reviewed to verify that changes have been implemented. They are:

- Operating Procedures
- Process Hazard Analysis
- Training

These elements must be crosschecked to see if they show that the changes have been followed through to completion.

APPENDIX B

Clarifications and Interpretations of the PSM Standard

Unless otherwise noted, all paragraph citations refer to Oregon OSHA's Division 2/H, OAR 437-002-1910.119. These are equivalent to federal OSHA's 29 CFR 1910.119.

This appendix contains clarifications agreed to in a settlement agreement dated April 5, 1993, between OSHA, the United Steelworkers of America, the Oil, Chemical and Atomic Workers International Union, and the Building and Construction Trades Department of the AFL-CIO. The settlement agreement clarifications reflect modifications jointly and cooperatively agreed to by the above parties and by the Chemical Manufacturers Association, the American Petroleum Institute, the Dow Chemical Company, and the National Petroleum Refiners Association. Where possible, the clarifications and interpretations have been presented in a question-and-answer format.

NOTE: Federal OSHA has stated that it plans to add future clarifications and interpretations to this appendix.

(a) Application

Registration: Do covered establishments have to register with OSHA?

No. There is no requirement that establishments covered by the standard register with or otherwise notify OSHA.

Explosives and fireworks manufactures: How does the PSM standard apply to pyrotechnics (fireworks) and explosives?

The PSM standard amended the scope of *1910.109 Explosives and Blasting Agents* by revising paragraph (k), requiring manufacturers of explosives and pyrotechnics to comply with 1910.119. As defined at 1910.109(a)(10), pyrotechnics are commonly referred to as fireworks. Employers who manufacture explosives and fireworks must comply with both 1910.109 and 1910.119. (In Oregon, *OAR 437-002-0109* ***Explosives and Blasting Agent,*** Tables OR-H-21 and OR-H-22, and their respective notes, including the definition of magazine in note #5 of OR-H-21.)

The applicability of 1910.109 and OAR 437-002-0109 to employers who manufacture fireworks is delineated in Oregon OSHA *Program Directive # A-286* (based on OSHA Instruction CPL 2.73, Fireworks Manufacturers: Compliance Policy.) According to that directive, a fireworks plant employer can be cited for violation of 1910.109 with reference to certain National Fire Protection Association (NFPA) standards in NFPA 1124, Code for the Manufacture, Transportation and Storage of Fireworks.

What is the role of the Bureau of Alcohol, Tobacco and Firearms (BATF) with respect to the PSM standard and fireworks manufacture?

By 27 CFR 55 Subpart K, BATF regulates the storage, including minimum distances, of explosive materials including fireworks in the workplace. As such, BATF limits the amount of special fireworks, pyrotechnic composition, and explosive materials used to assemble fireworks in processing building to no more than 500 pounds. Also, the maximum quantity of flash powder permitted by BATF in any fireworks process building is 10 pounds. These BATF limitations should not be confused with the applicability of the PSM standard to **any** amount of fireworks being manufactured.

Laboratories: Does the PSM standard apply to laboratory and research operations?

A laboratory or research operation involving at least the threshold quantity of one or more highly hazardous chemicals is subject to the PSM standard.

Flammable liquids: Are processes involving flammable liquids (for example, ethyl alcohol) covered by the standard?

Processes involving flammable liquids (for example, in a distillation process) in quantities at or above 10,000 lbs. are covered. Quantities of flammable liquids in storage are considered a part of the process if the storage tanks are interconnected with the process, or if they are sufficiently near the process that an explosion, fire, or release could reasonably involve the storage area combined with the process in quantities sufficient to meet the threshold amount of 10,000 lbs.

Flammable liquids that are stored on a tank farm (for example, a wholesale gasoline regional tank farm) where only transferring and storage are done are not covered by the PSM standard. They are, however, covered under **Division 2/H, 1910.106**.

(a)(1)(i) Processes that involve a chemical at or above the specified threshold quantities listed in Appendix A

Does the PSM standard apply to muriatic (32% HCL) acid?

The chemical names: hydrogen chloride (HCL) and anhydrous hydrochloric acid are included in the highly hazardous chemicals listing in Appendix A of the PSM standard. Anhydrous (without water) hydrochloric acid is hydrogen chloride. Both hydrogen chloride and anhydrous hydrochloric acid are identified by the same Chemical Abstract Service (CAS) Number 7647-01-0, as denoted in Appendix A. Hydrochloric acid (muriatic acid), which is a solution of hydrogen chloride gas in water, is not listed in Appendix A and therefore is not considered to be a highly hazardous chemical subject to the PSM standard.

What is meant by "Formaldehyde (Formalin)" listed in Appendix A of the PSM standard?

This highly hazardous chemical should be listed to read: Formaldehyde (37% by weight or greater). Federal OSHA has stated that the PSM standard will be revised "in the near future" to reflect this change. Any amount of mixture of Formaldehyde less than 37% by weight in solution would not be covered by the PSM standard.

Does the PSM standard apply to solutions of Dimethylamine?

Anhydrous Dimethylamine, identified by Chemical Abstract Service (CAS) Number 124-40-3, is listed in Appendix A of the PSM Standard as a highly hazardous chemical. Dimethylamine in aqueous solutions, which is not listed in Appendix A, is not considered to be a highly hazardous chemical covered by the PSM standard except when the solution qualifies as a flammable liquid.

Highly Hazardous Chemical (HHC) mixtures: Does the threshold quantity listed under Appendix A of the PSM standard apply to the quantity of the whole mixture or just the quantity of the component chemical, or to neither?

The threshold quantities listed in Appendix A of the standard apply only to pure (or commercial grade) chemicals unless otherwise specified, for example, Hydrogen Peroxide, 52% by weight or greater.

Does the PSM standard apply to an employer who uses cellulose nitrate in a concentration greater than 12.6% nitrogen to which water is added, producing a mixture containing greater than 23% water, which will not burn?

Appendix A of the standard lists cellulose nitrate in concentrations of greater than 12.6% nitrogen as a chemical which presents a potential for a catastrophic event at or above the threshold quantity of 2500 pounds (1,133.9 kg). The standard does not distinguish between "wet" or "dry" cellulose nitrate.

If an employer's process involves cellulose nitrate in a concentration greater than 12.6% nitrogen, with the total quantity of the mixture or solution at or above the threshold quantity – no matter what percentage of water is used in treatment – the process is covered under the requirements of the PSM standard.

Does the PSM standard apply to the EPA-regulated and permitted RCRA hazardous waste treatment, storage and disposal (TSD) facilities, when such facilities keep on-site, in one location, a hazardous waste chemical in a concentration and quantity which exceeds the applicable threshold quantity of Appendix A. If so, why? If not, why not?

Employers of worksites with TSD facilities which contain covered processes must comply with the PSM standard. The requirements of the PSM standard are intended to eliminate or mitigate workplace catastrophic releases of highly hazardous chemicals and resulting employee exposure to explosion, fire and toxic hazards.

Covered process: dispersal of inventory. Can an employer who keeps threshold quantities of highly hazardous chemicals listed in Appendix A to 1910.119, such as ammonia, separated into smaller lots and used and stored in separate systems or locations, be exempt from the requirements of the PSM standard?

From a storage standpoint, the 1910.119 standard would not apply to an employer who segregates his inventory by dispersing storage of highly hazardous chemicals, such as ammonia, in amounts which do not exceed the threshold quantity so that a release from one storage area would not contribute to or cause a release from others around the workplace. Additionally, an employer could reduce his on-site inventory of highly hazardous chemicals by ordering more frequent, smaller shipments so that they do not exceed the threshold quantities set forth in the PSM Standard.

The PSM standard's non-mandatory Appendix C suggests that if reduced inventory of highly hazardous chemicals is not feasible, an employer might consider dispersing inventory to several locations on-site. When are such materials to be considered part of a single process?

Under the definition of "process" provided at 1910.119(b), any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process. Inventories of highly hazardous chemicals would not be considered to be adequately dispersed if the storage vessels are connected with or in proximity to a covered process such that they could be involved in a potential release.

What evaluation techniques are appropriate to determine adequate separation distances?

OSHA has not developed, nor is it aware of, any standard evaluation technique to determine adequate distances to separate chemical inventories. If an employer chooses to disperse highly hazardous chemicals on-site, the separation distances would have to be determined on a case-by-case basis, considering such factors as the nature of the chemicals and covered processes, total inventories, threshold quantities of pertinent chemicals, and facility layout.

(a)(1)(ii) Application to processes that involve certain flammable gases or flammable liquids.

55-gallon drums: Would more than 10,000 pounds (4535.9 kg) of a flammable liquid stored together in 55-gallon (209-liter) drums be covered under the PSM standard?

For the purposes of the PSM standard, this would be considered exempt as storage in atmospheric tanks (notwithstanding the definitions of “containers” and “tanks” in 1910.106), unless the drums are near a covered process as described under “Covered process –Flammable liquids,” below. For the purposes of 1910.106, 55-gallon (209-liter) drums are covered in the definition of “container.”

Covered Process – Flammable gases: For processes involving flammable gas mixtures, are the non flammable components in a flammable gas mixture included when determining the threshold quantity?

The non-flammable components contribute to the determination of threshold quantity, In this case, 10,000 pounds (4535.9 kg) or greater amounts of a flammable gas as defined in Appendix B to §1910.1200, Physical Hazard Criteria at **B.2 FLAMMABLE GASES**:

(a) *Flammable gas* means a gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi).

(b) A flammable gas shall be classified in one of the two categories for this class in accordance with Table B.2.1:

Covered process – Flammable liquids: Does the PSM standard apply to processes in a paint manufacturing facility, which include the mixing and blending of flammable liquids with other raw materials, and which typically involve few or no chemical reactions? [Typically, the flammable products are processed below their normal boiling points and that several large batch vessels are located near each other, with an aggregate weight above the threshold quantity of 10,000 pounds (4535.9 kilograms).]

The requirements of the PSM standard would apply to such operations. The exemption provided in the standard at 1910.119(a)(1)(ii)(B) for situations involving flammable liquids applies only when such liquids are being stored in atmospheric tanks (where the tank pressure does not exceed 0.5 pounds per square inch gauge [p.s.i.g.]) or transferred and the liquids are kept below their normal boiling point without benefit of chilling or refrigeration. This exemption does not apply to a mixing and blending operation related to paint manufacturing.

(a)(1)(ii)(A) Hydrocarbon fuel exceptions.

Does the PSM standard apply to ceramic manufacturing facilities utilizing propane in amounts exceeding 10,000 pounds as the fuel for firing ceramic ware in a process which does not involve any other highly hazardous chemicals?

No. The PSM standard would not apply to such a situation.

Does gasoline used as a fuel to test run inboard and outboard engines fall within the scope of the PSM standard?

Gasoline used in such a manner does not fall within the scope of 1910.119, because it is used as a fuel in this situation and thus meets the exception at 1910.119(a)(l)(ii)(A). However, other OSHA standards, such as 1910.106, Flammable and combustible liquids, would apply.

Does the PSM standard apply to a plant that has more than 10,000 pounds of hydrocarbon fuel on site where the fuel is used solely as a fuel for a furnace used to melt glass?

The requirements of 1910.119 do not apply to this situation because 1910.119(a)(1)(ii)(A) of the standard specifically excludes from coverage hydrocarbon fuels used solely for workplace consumption as a fuel if the fuel is not part of a process containing another highly hazardous chemical covered by the standard.

Tote tanks: 350-gallon tote tanks containing flammable liquids are used at a facility to refuel vehicles. Are they covered by the standard?

No. 1910.119(a)(1)(ii)(a) exempts hydrocarbon fuels used solely for workplace consumption as a fuel (for example, gasoline for vehicle refueling) if such fuels are not part of a process containing another highly hazardous chemical covered by the standard. They are, however, covered under 1910.106.

Fuels for heating: Are flammable liquids and gases used as fuels for such items as heaters or exchanges contained in (covered) processes also included within the coverage of the standard?

Furnaces, boilers, heaters, fueled by flammable liquids or gases – regardless of the quantity of the fuel – used in processes that are otherwise covered by the PSM standard (for example, the existence of a threshold quantity of another highly hazardous chemical) are considered part of the process and are covered by the PSM standard. Flammable liquid-or-gas-fueled furnaces, boilers, used in processes not otherwise covered by the PSM standard are exempt from the standard.

(a)(1)(ii)(B) Other process exceptions

Tank farms: Are flammable liquids stored in a tank farm covered under the standard?

Atmospheric tanks containing flammable liquids at bulk transfer terminals are not covered. However, atmospheric tanks containing flammable liquids that have feeder connections to processes **are** covered by the standard.

EXAMPLE. Atmospheric tanks in an outside storage area contain a flammable liquid that is pumped to a mixing vessel. If the total quantity of flammable liquids in this equipment is at or above 10,000 pounds (4535.9 kg), then this is a covered process which includes, at a minimum, the storage tanks, the piping, and the mixing vessel.

Flammable liquids: Does 1910.119(a)(l)(ii)(B) exempt all flammable liquids stored or transferred which are kept below their normal boiling point without the benefit of chilling or refrigeration, including, but not limited to, flammable liquids in atmospheric tanks?

No. The exemption is limited to flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration. This exemption is applicable to flammable liquids in tanks, containers and pipes used only for storage and transfer (to storage), and not connected to a process or a process vessel. Similarly, stored flammable liquids in containers, including cans, barrels and drums, would be exempt from coverage by the PSM standard. We recommend you carefully consider the definition of "process" to determine further applicability of the PSM standard in situations where flammable liquids are stored in tanks or containers at a worksite.

(a)(2) Exceptions: meaning of facility

Can a facility contain more than one process?

A facility can include multiple processes. If multiple processes are interconnected, they may be considered a single process for purposes of the standard.

(a)(2)(i) Exception for retail facilities

What is the definition of retail facilities that are exempted from coverage by the PSM standard?

Retail facilities typically obtain more than half of their income from direct sales to end users. With respect to enforcement of the PSM standard, a **retail facility** is an establishment that is exempted from the PSM requirements based on federal OSHA's conclusion that -- because the chemicals are in small volume packages -- large, catastrophic releases are unlikely at these facilities. (See Appendix D to this PD for an Oregon Policy Memo concerning farm supply businesses storing large quantities of anhydrous ammonia.)

If an employer that would otherwise be covered by the PSM standard operates at several locations and the majority of its income comes from sales to end users, is the employer exempt as a retail facility?

A retail facility is "an establishment which would otherwise be subject to the PSM standard, at which more than half of the income is obtained from direct sales to end users." If such an employer operates at multiple locations, the question becomes whether this constitutes a single "establishment" for the purposes of the standard.

The intent of the PSM Standard is to prevent catastrophic releases of highly hazardous chemicals, and thereby to provide safe and healthful workplaces for employees. Consistent with this intent, the term "establishment," when used to define retail facility, means a company name at a specific site (normally with a street address). Thus, if an employer operates at several locations, some might be covered by the standard, and others not affected.

Are facilities that fill propane tanks for will call type customers exempt from the PSM standard? Most of these facilities are under the aggregate quantity of 10,000 pounds (4535.9 kilograms), and the majority of the business is transferring propane from the supply tank to small containers for barbecues and "RV" units.

Such facilities appear to be exempt from coverage by the PSM standard because they are retail facilities or because they do not involve processes with threshold (or greater) quantities of propane.

(a)(2)(ii) Exception for oil or gas well operations

Are single well processing facilities with equipment including separators, heat-treaters and storage tanks used in gas production operations (from non-H2S containing petroleum fluids) exempt from coverage under 1910.119(a)(2)(ii), which excludes oil and gas well drilling and servicing operations?

The 1910.119(a)(ii) exemption of oil or gas well drilling or servicing operations is intended to cover all drilling operations and any well servicing operation including acidizing. Additionally, water separation facilities adjacent to or near the well (including tanks used primarily for water separation in conjunction with oil or gas well production) are not normally covered by the PSM standard.

The following processes, when they involve at least threshold quantities of oil or gas, are covered by the PSM standard: Oil or gas well production fluids from several wells are processed by heating the fluids and physically separating the water from the gas or oil. The water is returned to the ground via a "down hole well" for disposal or return to the strata from which it came. However, if these oil or gas well drilling operations take place at "normally unoccupied remote facilities", then according to 1910.119(a)(2)(iii), they would be exempt from PSM standard coverage.

(b) Definitions

Process and aggregate threshold quantities:

In the definition of “process,” quantities of a hazardous chemical contained in vessels that are interconnected – and quantities in unconnected vessels that may be adversely affected due to an incident at a nearby process – must be combined to determine whether the threshold level of a hazardous chemical has been reached. If the threshold level is met or exceeded by combining the amount in separate tanks and in interconnected vessels, then all of these may be considered one process.

Is burning of covered solvents as waste considered a process?

Yes.

Hot work and Spark-producing operations include operations which use flame-or spark-producing equipment, such as grinders, welding, burning, or brazing that are capable of igniting flammable vapors or gases.

Normally unoccupied remote facility means a location where employees are not permanently stationed. This includes those sites for which periodic visits by employees may be made on a scheduled basis. Examples could include pump stations located miles from the main establishment. Employees may be assigned to check on the station as needed.

The intent behind "remote" is that, due to the isolation of the process from employees by distance, such employees would not likely be affected by the consequences of a catastrophic release. Therefore, the remote location must be geographically separated from other facilities and employees such that employees would not be affected by an explosion, vapor cloud of toxic gas, or other consequence of an uncontrolled release at the remote site.

(c) Employee participation

In implementing employee participation as required by 1910.119 (c) of the PSM standard, can an employer mandate that employees for example, top operators of process units, provide the company with information such as step-by-step procedures for routine tasks performed on their operating units? Can the employer threaten disciplinary action for employees who do not cooperate?

The employee participation called for at 1910.119(c) is intended to provide for a cooperative participatory environment and necessary flow of information from management to employees and from employees to management on process safety to eliminate or mitigate the consequences of catastrophic releases of highly hazardous chemicals in the workplace.

The plan-of-action standard at 1910.119(c)(1) is intended to ensure that the employer actively considers the appropriate method of employee participation in the implementation of the PSM program in the workplace.

Paragraphs 1910.119(c)(2) and (c)(3) contains language taken from the Clean Air Act Amendments (CAAA) of 1990. The standard requires that PSM information developed by the employer be made available to employees and their representatives. Also, OSHA requires that an employer consider and structure the plant's approach to employee involvement in the PSM program.

(c)(2) Consultation

What does consult mean? Can the employer simply inform the employees?

Consultation refers to a two-way dialogue between the employer and the employees and their representatives (where they exist), in which the employer elicits, and responds to, employees' concerns and suggestions bearing upon the elements of process safety management required under this standard. Consultation is therefore more than a way to inform employees about aspects of process safety; it is a process of seeking advice, criticisms, and suggestions from employees and their representatives.

The employer should establish a method for informing all employees and their representatives that their process safety concerns and suggestions are welcome. The employer must also establish a mechanism by which it will respond, orally or in writing, to such concerns and suggestions.

In addition, the employer should affirmatively solicit the suggestions and concerns of employees and their representatives, who, by virtue of their job responsibilities, actual knowledge, or representative positions, can reasonably be expected to make substantive contributions to the development and evaluation of specific elements of process safety management.

The standard requires employers to consult with employees and their representatives. Is the term broad enough to include a representative of the international union? A consultant designated by the union local or international?

The standard requires consultation with **"employees and their representatives"**. The term "**employee representative**" is intended to mean **union representative** where a union exists, or an employee designated representative in the absence of a union. The term is to be construed broadly, and may include the local union, the international union, or an individual designated by these parties, such as the safety and health committee representative at the site or a non-employee consultant. In the absence of a union, employees have a right under the standard to designate a representative to participate in the consultation process.

The employer's PHA team must always consist of one or more persons knowledgeable about the process. The intent of the consultation requirement at 1910.119(c)(2) is not to compel the inclusion of any person(s) who are not knowledgeable; ideally, the employer and employees/employee representatives should reach a consensus on including the most capable parties.

Consultation with contractors: Must the employer consult with employees of contractors?

A host employer must consult with employees of covered contractors and their representatives, to the same extent that it must consult with similarly situated direct hire employees. Therefore, the host employer must establish a method for informing all contractor employees and their representatives that their process safety concerns and suggestions are welcome, and will be responded to. In addition, the following non-exclusive examples illustrate circumstances under which the host employer may be required to solicit the advice and suggestions of specific contractor employees about specific aspects of process safety:

- Contract employees who function as process operators on covered processes, or perform routine maintenance on covered processes, should be consulted to the same extent as equivalent direct hire operating and maintenance employees, respectively.

- Contract employees who routinely interface with a host employer's Management of Change program should be consulted on the effectiveness of the program as it relates to their jobs and based upon their interaction with it.
- Contract employees who routinely participate in activities pursuant to mechanical integrity should be consulted on the effectiveness of the program as it relates to their jobs and based upon their interaction with it; for example, contract employees should be encouraged to identify any deficiencies they observe in the host employer's program.
- Contract employees who have unique experience or knowledge concerning the operation, maintenance, or safe performance of any portion of a covered process should be consulted, as appropriate, on that portion of the process during the PHA.
- Contract employees who routinely interface with the host employer's safe work practices (such as, for example, the employer's lockout/tagout rules, hot work permit procedures, and confined space entry procedures) should be consulted as to the effectiveness of those practices.

Host employers can consult with contractor employees and their representatives directly, or through the contractor employer. Contractor employers share responsibility for ensuring that there is consultation with their employees.

(c)(3) What does it mean to provide access to information? Does this mean simply make it available at a central location? Does the employer have to make copies for employees if requested?

The intent of **access** under this standard is for the information to be made available for employees and their representatives in a reasonable manner. Reasonable access may require providing copies or loaning documents. The trade secret provision of the standard permits the employer to require persons to whom the information is made available to agree to keep the information confidential before it is provided.

Equal access to information

Under (c)(3), the employer must provide access to process hazard analyses and all other information to be developed under this standard to employees of covered contractors, to the same extent that it must provide access to direct hire employees, if similarly situated. Contract employers share responsibility for ensuring that their employees are provided with the requested information.

(d) Process safety information

Retention of information about the technology of the process: How long must the employer maintain process safety information?

In order to demonstrate compliance, and to meet the purpose of the standard, process safety information is to be kept for the lifetime of the process, and updated whenever changes other than "replacement in kind" are made.

(d)(2)(ii) If the original technical information does not exist, what must the employer do?

The employer must obtain or generate the missing information. If the information on the original technology does not exist, then the employer may delay the development of this information until the process hazard analysis (PHA) is initiated; however, the other information required by this section must be compiled before conducting any PHA. The information on the technology must be gathered as the PHA's are conducted in accordance with the priority schedule developed by the employer. 1910.119(e)(1) specified a compliance timeline when the rule was new.

(d)(3)(ii) Employers must document that all equipment in PSM-covered processes complies with RAGAGEP.

Equipment that does not comply with RAGAGEP cannot be documented as compliant. Both the failure to document compliance and the deviations from compliance with RAGAGEP can be cited under (d)(3)ii). See guidance in Federal OSHA's 5/11/2016 Memorandum on RAGAGEP in PSM Enforcement. (Full text included as Appendix F to this program directive.)

(d)(3)(iii) The employer must determine that equipment designed and constructed according to old design codes is operated and maintained in a safe manner. Specifically:

- **When must the employer determine adequacy of design based on old codes?**
- **How much time does the employer have to make corrections?**

Generally speaking, the time frames that apply to implementation of the PHA's also apply to this requirement.

Such documentation must be completed either before or in conjunction with the development of the PHA, except where a pre-startup safety review is required, in which case the documentation must be completed before startup. For older equipment, this may require verification that the design and construction are safe for the intended application. Where corrective action is required as a result of the PHA, it must be completed as soon as possible pursuant to paragraph (e)(5).

EXCEPTION: For actions required by a pre-startup safety review (see (i)(2)), such corrective action must be implemented prior to the startup if the correction is safety-critical.

(e) Process hazard analysis (PHA)

PHA priority: What rationale must employers use to determine the priority for conducting the process hazard analyses? May the rationale include age, history, and extent of employee exposure?

The appropriate priority for conducting PHA's is to be determined by using all of the criteria identified in this paragraph, for example, extent of the process hazards (catastrophic potential), age of the process, number of potentially exposed employees, and operating history. Other appropriate factors may also be considered in establishing the priority. The documentation required by this paragraph shall demonstrate the underlying rationale for the prioritization.

(e)(1) Completing the process hazard analysis as soon as possible.

Paragraph (e) contains a five year phased-in compliance schedule for employers to complete their process hazard analyses by May, 1997. Employers were required to first "determine and document the priority order for conducting process hazard analyses" and then complete 25 percent or more of the analyses each year after the second year. However, because OSHA believed that "plants with a limited number of processes, with simple processes, or which have already completed a number of process hazard analyses" would need less time to complete their analyses, it included a specific provision requiring that analyses "be completed as soon as possible."

PHA completion dates: **What was the original time frame for completion of the initial PHAs and for updating and revalidating them?**

1910.119(e)(l) required all initial PHAs to be completed as soon as possible, with a minimum percentage to be completed over the following three years and all completed by May 26, 1997.

1910.119(e)(6) requires that all initial PHAs be updated and revalidated at least every 5 years thereafter. Employers must complete subsequent updates and revalidations within the next 5-year period.

PHAs required site-by-site? **If a natural gas company has five sites with facilities performing the same process, does a separate PHA need to be performed for each site, for each facility at these sites, or for each process at each facility?**

The PSM Standard is applicable, on a site-by-site basis, to each worksite which has one or more facilities containing one or more processes involving one or more of the covered highly hazardous chemicals. A worksite may be one facility containing a single process; or a worksite may be a complex of facilities, each containing one or more processes. (See the definition of "facility" in Subsection (b) of 1910.119).

An employer may use a generic hazard analysis approach for the same (or nearly the same) covered process at each individual worksite. The employer must account for variations (for example, differences in siting, incident histories, technology, equipment, or operations) for each process covered by this generic approach. [Generic process hazard analysis is addressed in section 4. of nonmandatory Appendix C to 1910.119, Compliance Guidelines and Recommendation for Process Safety Management.]

(e)(2) Methodologies for determining and evaluating process hazards.

Appropriate methodology: What type of methodology must employers use in the PHA in order to be sure it is appropriate?

Employers are expected to use sound judgment, on a case-by-case basis, to determine an appropriate methodology for the process hazard analysis for each covered process. It is not the intent of the standard to require a PHA methodology that is excessively burdensome, but rather one that is appropriate and which will have the capability to elicit all hazards, defects, failure possibilities, for the process being analyzed, and also have the capability to address all the factors at 1910.119(e)(3).

(e)(3) –Hazard Analysis

Meaning of control: The regulation requires that the PHA address the control of the hazards. What is meant by identification, evaluation, and control of process hazards?

The PHA is intended to identify and evaluate acceptable controls for process hazards. The evaluation of the hazards must include all the steps set out in section (e)(3)(i) -vii), using a methodology consistent with section (e)(2). Through the timely resolution of the PHA findings and recommendations, the PHA is intended to control process hazards.

Qualitative determination? **Must the employer make a qualitative determination of the consequences of failure of the controls?**

Yes, the employer must at least identify each type of control and the possible effects of the failure of the listed control. OSHA believes employers can determine the consequences of a failure of these controls, and establish a reasonable estimate of the safety and health effects on employees.

Facility siting: What does "facility siting" mean?

With respect to existing plants, "siting" does not refer to the site of the plant in relation to the surrounding community. It refers, rather, to the location of various components within the establishment.

(e)(5) – A system to promptly address recommendations

Timeliness. Employers must "promptly" address the problems identified in the PHA in a "timely manner," and complete actions "as soon as possible." What time frame did OSHA intend here?

The standard's intent is for the employer to take corrective action as soon as possible. “As soon as possible” means that the employer must proceed with all due speed, considering the complexity of the recommendation and the difficulty of implementation. OSHA expects employers to develop a schedule for completion of corrective actions, to document what actions are to be taken, and to document the completion of those actions as they occur.

Hazards may be identified for which a recommended solution/action might be the shutdown of the process. For example, several processes might be located very close, and if fire were to occur a domino effect might result in a catastrophic release. The resolution may be to separate the processes, but there is no additional property on which to expand. What is required of the employer if abatement is equal to shutdown?

In such situations, the employer could implement protective measures to minimize the probability of a major uncontrolled release. An appropriate response in this specific case, for example, might be to install additional detection systems which may be interlocked to deluge systems for tanks and process equipment, to provide additional protective measures for onsite personnel, and to implement administrative controls, such as reducing inventories and numbers of exposed personnel.

Addressing PHA team's findings and recommendations

Paragraph (e) of the standard requires that a team with expertise in engineering and process operations conduct a process hazard analysis, containing specific findings and recommendations for each covered process. The employer is then required to promptly "address" and "resolve" the team's findings, document the actions taken, and communicate these actions to the affected employees.

OSHA considers an employer to have "resolved" the team's findings and recommendations when the employer either has adopted the recommendations, or has justifiably declined to do so. Where a recommendation is rejected, the employer must communicate this to the team, and expeditiously resolve any subsequent recommendations of the team.

An employer can justifiably decline to adopt a recommendation where the employer can document, in writing and based upon adequate evidence, that one or more of the following conditions are true:

1. The analysis upon which the recommendation is based contains material factual errors;
2. The recommendation is not necessary to protect the health and safety of the employer's own employees, or the employees of contractors;
3. An alternative measure would provide a sufficient level of protection; or
4. The recommendation is infeasible.

(e)(7) Retention

How long must the process hazard analyses, updates, and revalidations be retained?

For the life of the process.

(f) Operating procedures

Section (f)(1) requires written operating procedures. Many employers have computerized process control systems and safety interlock systems software. Can simplified loop diagrams or narrative descriptions be used to describe the logic of software and the relationship between the equipment and computerized process control systems, to meet the requirements for written operating procedures at 1910.119(f)(1)? Can system logic flow charts or narrative descriptions of the computerized safety interlock systems be used to meet these same requirements?

It is anticipated that employers would include loop diagrams, flow charts, and narrative descriptions of control and interlock systems in their compilations of written process safety information required by 1910.119(d) before conducting any PHAs required by 1910.119(e). Written operating procedures must be developed to provide clear instructions for safely conducting activities involved in each covered process, consistent with the process safety information and with the associated PHA. Simplified diagrams, flow charts, and narratives could be used in conjunction with instructions to meet the requirements for written operating procedures.

(f)(1)(iii)(c) "Control measures to be taken if physical contact or airborne exposure occurs." Does this mean first aid, or industrial hygiene services?

It primarily means first aid procedures or emergency medical attention, which should be consistent with the information on the material safety data sheet.

(g) Training

(g)(1)(i) Initial training

The requirement to complete raining in an overview of the process, and in safety and health hazards, emergency operations, and safe work practices, was effective May 26, 1992. In situations where operating procedures were already in place, training in those existing procedures was required by May 26, 1992. Initial training had to have been provided by that date, based on existing procedures and available process information. (For new hires, provide initial training as part of the employee's orientation.) As new information and procedures are developed, refresher training must be provided in accordance with paragraph (g)(2).

(g)(1)(ii) Initial training: "grandfathering."
What is required in the employer's written certification regarding employees whose initial training is "grandfathered"?

Where employees involved in operating the process have not received the initial training required under (g)(1)(i), but have been involved in operating the process safely for a period of time prior to May 26, 1992, the employer may waive the initial training requirement by **certifying in writing** that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures, written or otherwise. Such certification may be based on on-the-job evaluation or other equivalent determination methods. When new operating procedures -- which must be written -- are subsequently developed, the employer must give training to operating employees prior to their implementation.

(g)(2) Refresher training
Employees have to be given refresher training at least every 3 years -- measured from when?

The time period for refresher training of an employee involved in operating a process is to be measured from the date of the employee's last training in the overview and current operating procedures of the process. [or see "grandfathering," as allowed at (g)(1)(ii)]

Under what circumstances is refresher training required to be provided more often than every 3 years?

Employers, in consultation with employees, must determine the appropriate frequency, which may be based on consideration of such factors as deviations from standard operating procedures, recent incidents, or apparent deficiencies in training.

Is training under "management of change" considered to be refresher training?

No. It is an independent training requirement, in addition to other training requirements of the standard.

(g)(3) Training documentation

This paragraph requires the employer to make sure that operators "understand" the training provided to them under this section. Is some method of testing required?

There must be some positive means taken by the employer to determine if employees have understood their training and are capable of adhering to the current operating procedures of the process. This could include the administration of a written test, although the standard does not require that a formal written test be used. Other means of ascertaining comprehension of the training, such as on-the-job demonstrations are acceptable, as long as they are adequately documented.

(h) Contractors -- Scope of activities

The list of covered and exempted activities in paragraph (h) is meant to be illustrative of potential contractor activities. The standard covers all contractor activities that have the potential for affecting process safety. Therefore, paragraph (h) applies to all contractor activities on or adjacent to a covered process, except those incidental activities that do not influence process safety. (Examples include simple janitorial work, food and drink services, laundry, delivery or other supply services.) Consequently, contractors performing construction, demolition, equipment installation and other work that may affect the safety of a covered process must comply with the requirements of this paragraph. Depending upon the circumstances, other provisions of the process safety management standard, in addition to paragraph (h) can apply to contractors.

Scope of construction work activities. Do contractors performing construction work at a site covered by the PSM standard also have to comply with the Division 3, 1926 standards?

Contractors performing construction work at a site covered by the PSM standard must comply with all applicable standards under Division 3, 1926, including Part 1926, Subpart C requirements.

1910.12(b) defines the term "construction work," and 1926.13 discusses the terms "construction," "alteration," and "repair."

(h)(1) and (2) Contractors and subcontractors

The host employer and the general contractor are both responsible for ensuring that the duties contained in (h)(2) are performed. This applies to inquiring into the safety records of their subcontractors, informing the subcontractor as to the known potential hazards, the emergency action plan, and safe work practices, and ensuring the subcontractor's compliance with the standard.

Under (h)(2)(v), the host employer must ensure that the contract employer and the subcontractors are properly performing their obligations under (h)(2) with respect to compliance with the standard The intention is that host employers and contractors

exercise responsible oversight of their respective contractors' and subcontractors' performance of safety and health requirements under the standard.

Responsibility for training contractor employees
How much of the burden of training contractor employees is placed on the employer?

The burden of training contractor employees is on the contractor employer. However, under 1910.119(h)(2)(v), the host employer shall periodically evaluate the contract employer's performance with respect to the (contract) employee instruction and training requirements at 1910.119(h)(3).

NOTE: The employer must inform a contract employer of the hazards related to the contractor's work and the process [as noted at 1910.119(h)(2)(ii) and (iii)].

Although the standard places the primary responsibility for providing training to its employees on the contract employer itself, the host employer bears the responsibility to "periodically evaluate the performance of contract employers in fulfilling their obligations as specified in paragraph (h)(3)." Such "obligations" clearly include training. The standard also requires the host employer to select a contract employer only after evaluating its safety performance and programs [(h)(2)(i)], and to inform the contract employer about the specific hazards associated with the process [(h)(2)(ii)] and the provisions of the emergency action plan [(h)(2)(iii)].

If contract employees are involved in operating a process or maintaining the on-going integrity of process equipment, then they must receive training in accordance with the specific training requirements set forth in paragraphs (g) and (j), respectively.

In order to satisfy its obligations under (h)(2)(v), the host employer must ensure, through periodic evaluations, that the training provided to these contract employees by the contract employer is in fact equivalent to the training that the standard requires for direct hire employees. Such training need not be identical in format or content or context to training given to the host's employees. The critical element is that information required by the standard must be conveyed to and learned by contract employees as well as direct hire employees. The obligation may be satisfied by joint training or by separate, individual training.

Moreover, (h) requires that every employee of a covered contractor be trained in the work practices necessary to perform safely his or her job. The contract employee must be able to perform his or her own job tasks safely and should receive:

> Training prior to beginning work on or near a covered process. This training should encompass:
>
> > (i) instruction regarding known process hazards related to his or her job, including training in the applicable provisions of the emergency action plan; and

(ii) training in the safe work practices adopted by the host employer and the contract employer; and

Additional training, as necessary:

(i) to prepare the employee for changes in the operations or work practices at the facility; and

(ii) to ensure that the employees' understanding of the applicable safe work practices and other rules remains current.

(h)(2)(i) Employer responsibilities for selecting a contractor

When selecting a contractor, an employer has to evaluate the potential contractor's safety performance and programs. Must the employer document this? If so, to what extent?

The standard does not require the employer to document the evaluation of the information obtained regarding contractor safety performance and programs. However, OSHA compliance officers are directed to review records about these aspects of the selection process and to determine if the employer has met the intent of this provision. (See Appendix A of this directive.)

(h)(2)(vi) Contractors – Employer responsibilities

Contractor injury and illness log. What type of injury and illness log does an employer have to maintain regarding contract employees?

If the contract employer is willing to share the OSHA 200 log and OSHA 101 first reports of injury (or equivalent) with the employer, and if those logs and reports specifically indicate which injuries and illnesses are related to process areas, then such records would be acceptable to OSHA. Acceptable alternatives would be for the employer to develop a contract employee injury and illness log separately for each contractor, or a combined log for all contractors if the combined log distinguishes among contractors.

(i)(2)(i) Pre-startup safety review – equipment in accordance with design specifications

The employer is responsible for ensuring that process equipment meets design specifications prior to startup. For equipment that has been modified to the extent that a change to the process safety information is required, the employer must ensure that the process safety information has been modified prior to startup. (Note also the requirements of 1910.119(j)(4)(ii), Mechanical integrity, inspection and testing.)

(j) Mechanical integrity

(j)(1)(i) Application

"Pressure vessels and storage tanks" include "pressurized" storage tanks; that is, tanks designed to be used above atmospheric pressure, as well as non-pressurized (atmospheric) storage tanks.

(j)(2) Written Procedures

The purpose of this provision is to require written procedures in adequate detail to ensure that the specific process equipment receives careful, appropriate, regularly scheduled

maintenance to ensure its continued safe operation. A "breakdown" maintenance program (that is, a program wherein action is taken only when something breaks down) does not meet the requirements of this paragraph.

Do these written procedures need to be specific to each vessel, each type of vessel, or each group of equipment types listed?

The procedures need to be specific to the type of vessel or equipment. Identical or very similar vessels and items of equipment in similar service need not have individualized maintenance procedures. Each procedure must clearly identify the equipment to which it applies.

(j)(3) Training for process maintenance activities

As OSHA indicated in the preamble, paragraph (j)(3) requires that employers provide maintenance employees with "on-going" or "continual" training adequate "to assure that they can perform their jobs in a safe manner." [See 57 Fed. Reg. 6390/1.] The paragraph clearly considers that new maintenance employees must be trained before beginning work at the site, and that all maintenance employees receive additional training appropriate to their constantly changing job tasks.

Although maintenance employees don't need to be trained in process operating procedures to the same extent as those employees who are actually involved in operating the process, they must be trained in all procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner. A maintenance worker sent to work on a process breakdown must be trained in operating procedures that are relevant to the repair or installation on which he or she is working.

OSHA intends that employers incorporate all safety-related topics applicable to maintenance tasks into the ongoing training program required by paragraph (j) to assure that maintenance employees can perform their job tasks in a safe manner. In order to train maintenance workers in "procedures applicable" to their job tasks under paragraph an employer must, in appropriate circumstances, train these workers in the safe work practices required under paragraph (f)(4), in the written procedures to manage change under paragraph (l), and in the appropriate provisions of the emergency action plan under paragraph (n) of the standard. These provisions may implicate other OSHA general industry requirements, for instance, the training requirements of the lockout/tagout standard. [See 1910.147(c)(7).]

(j)(4)ii) Inspections and tests are performed on process equipment subject to the standard's mechanical integrity requirements in accordance with RAGAGEP.

See guidance in Federal OSHA's 5/11/2016 Memorandum on *RAGAGEP in PSM Enforcement.* (Full text included as Appendix F to this program directive.)

(j)(4)(iii) Inspection and test frequency follows manufacturer's recommendations and good engineering practice, and more frequently in indicated by operating experience.

See guidance in Federal OSHA's 5/11/2016 Memorandum on *RAGAGEP in PSM Enforcement*. (Full text included as Appendix F to this program directive.)

(j)(5) Equipment deficiencies

If equipment is found to be operating outside acceptable limits, must the process be shut down and the equipment deficiencies corrected before further use?

To ensure the ongoing mechanical integrity of the covered process, equipment deficiencies must be corrected promptly if the equipment is outside the acceptable limits specified in the process safety information. There may be situations where it may not be necessary that the deficiencies be corrected "before further use" as long as the deficiencies are corrected in a safe and timely manner when necessary means (for example, protective measures and continuous monitoring) are taken to ensure safe operation. If an employer fails to correct the deficiency before further use or fails to implement adequate interim measures and to schedule a permanent correction timely, the failure may be cited under this rule. Citations of (j)(5) are often grouped with citations of (d)(3)(ii). See guidance in Federal OSHA's 5/11/2016 Memorandum on *RAGAGEP in PSM Enforcement.*

(j)(6)(ii) Quality assurance

If an installation is being done by contractors, does this require the employer to implement a quality assurance program to monitor the activities of these contractors?

The employer is responsible for ensuring that equipment is installed consistent with design specifications and manufacturer's instructions. This may require the employer to be involved in the review, inspection, certification, and quality assurance of work performed by contractors.

(l) Management of change

What does "change" encompass?

Any change whatsoever that may affect a covered process triggers the management of change provisions. The only exception to this is when there is a replacement in kind.

Does the management of change procedures apply to items such as gaskets?

Replacements in kind are not covered. If a new gasket is to be installed that is of different material, composition, shape, size, or design, then a management of change would be required.

(m) Incident investigation

(m)(5) Addressing team's findings

Paragraph (m) requires that a team of knowledgeable individuals investigate every catastrophic incident and "near-miss," and likewise requires that the employer promptly "address and resolve" the team's recommendations and document corrective action.

As with the similar provision in paragraph (e), this was designed to require the employer to respond to the team's findings and recommendations, while at the same time allowing the employer the flexibility not only to reject proposals that are erroneous or infeasible, but also to modify a recommendation that may not be as protective as possible or may be no more protective than a less complex or expensive measure. [See: 57 Fed. Reg. 6395/3.]

OSHA considers an employer to have resolved the team's findings and recommendations when the employer either has adopted the recommendations, or has justifiably declined to do so. Where a recommendation is rejected, the employer must communicate this to the team, and expeditiously resolve any subsequent recommendations of the team.
An employer can justifiably decline to adopt a recommendation where the employer can document, in writing and based upon adequate evidence, that one or more of the following conditions are true:

1. The analysis upon which the recommendation is based contains material factual errors.
2. The recommendation is not necessary to protect the health and safety of the employer's own employees, or the employees of contractors.
3. An alternative measure would provide a sufficient level of protection.
4. The recommendation is infeasible.

(o) Compliance audits

(o)(1) Required frequency of compliance audits

Employers must certify at least every three years that they have evaluated compliance with 1910.119. Under 1910.119(o)(1), employers must conduct compliance audits in a timely manner to meet this certification requirement. The first certification is required no later than May 26, 1995. Subsequent certification must be within three years from the certification date.

NOTE: It may be necessary for employers to conduct compliance audits and certify that they have evaluated compliance more frequently than every three years, because of significant or numerous deficiencies disclosed by the previous audit, or for other reasons.

(o)(4) Documenting actions based on compliance audit findings

The purpose of this paragraph is to ensure that employers determine an appropriate response to each of the report findings and, if employers identify a deficiency that needs to be corrected, that they document the correction of the deficiency. The appropriate response to each of the report findings must be **promptly** documented. The correction of any identified deficiency must be documented as soon as possible after the corrective action is taken.

APPENDIX C

Recommended Guidelines for PSM Inspection Preparation (Nonmandatory)

The following guidelines are suggested as background and preparation for a PSM inspection. These are suggested actions only, and must in no case take precedence over the guidance presented elsewhere in this directive. The team concept outlined in this appendix would be used in facilities where the size and complexity of the PSM issues would necessitate such an approach

OFFICE COORDINATION

Coordination within the field office from which the inspection is being conducted is absolutely essential in the orderly conduct of a PSM inspection. The statewide enforcement manager and all those involved in a PSM inspection must commit the resources with the understanding that the project is long-term, possibly several weeks or months. It is imperative that team members complete all outstanding assignments prior to the PSM inspection. Equally important, team participants should not be directed or "asked" to do assignments while they are engaged in the PSM inspection. An obvious exception would be informal and formal hearings, over which the field office has little control.

The enforcement manager should designate a contact person in the field office to coordinate and oversee all aspects of the inspection. The contact person should be a manager (either safety or industrial hygiene (IH)) who is familiar with the PSM concept. In addition to providing field office coordination, the contact person would review the entire case file/report. The team leader would communicate at least weekly with the contact supervisor, who would then brief the enforcement manager as appropriate.

INSPECTION TEAM COMPOSITION

By design, a PSM inspection is a large and complex undertaking, to be accomplished by a select, well-trained team. All members of the team must be experienced journey or senior level compliance officers who are familiar with the chemical industry and have taken the appropriate OSHA training. Newer compliance officers can be utilized in the inspections, but not as a substitute for regular team members. The team should include members with expertise in occupational safety, construction and industrial hygiene, and other support, as needed.

The team leader should be a senior compliance officer with experience in large team inspections. They must have excellent organizational and communication skills, both oral and written. It would also be of benefit that the team leader be knowledgeable in word processing and data base management computer operations. Since the team leader will be the focal point during the conduct of the inspection, that person should also have demonstrated leadership abilities. The entire team, the company, employees/unions and other Oregon OSHA personnel will look to the team leader for direction and answers to the many questions that will arise during the course of the inspection.

The team leader is responsible for the overall conduct of the inspection including planning, onsite activities and report preparation. The leader would assign the various inspection areas to team members in accordance with their expertise and abilities, and determine what, if any, special expertise is needed. Additional responsibilities include:

1. Keeping the field office contact manager apprised of activities.
2. Providing and tracking requests for documents.
3. Resolving problems with the company.
4. Ensuring that the report addresses all questions in the directive.

An administrative support person would greatly increase the overall efficiency of the inspection. The support person would answer directly to the team leader and would be responsible for organizing, labeling and filing the many documents that will become part of the case file. The support person would also be responsible for the inspection supplies and equipment.

Safety and IH team members are responsible for carrying out the PSM inspection activities under the direction of the team leader. They must keep the team leader apprised of their activities and potential problems when they arise. A specific focus on construction may be needed depending on the size and complexity of these activities. Some crossover of inspection areas is to be expected, as many of the contractors and company responsibilities overlap.

PRE-INSPECTION PREPARATION

Effective planning and preparation is essential to the efficient implementation and successful completion of any large inspection, especially a PSM inspection. **Exhibit 1** provides an outline that can be used as a guide to plan and prepare for a PSM inspection. Establishment histories can be obtained and reviewed well in advance of the target date for the inspection. The inspection strategy and scheduling should be done after the team has been selected. A pre-inspection meeting with all members and the field office contact person should be held prior to entry.

The case file begins in the planning and preparation stage. Any documents received, such as micro to host reports, citations and PSM-related findings from other Oregon OSHA field offices and from federal OSHA must be logged and identified to allow for easy retrieval. An activity log/diary should be started to record all pertinent actions taken. A computer data base management program is recommended to keep track of the document requests and to provide a ready index of the documents that have been obtained. With this type of system it would be easy to search for pertinent documents by using the identification number, topic of document, company identification number, date of request, and to ensure that various members of the team do not duplicate requests for documents.

The team should develop a weekly schedule of activities, taking into account travel days, holidays, start time, stop time, company briefings and internal briefings. Time should be allotted during the inspection week to complete necessary paperwork and documentation and tie up loose ends.

DOCUMENTS

PSM inspections will require compliance officers to review numerous company documents. Many of these documents will become part of the case file as documentation for potential citations or for documentation of the required PSM elements. It is imperative that these documents be organized and identified so that they may be readily referenced and reviewed. It is highly recommended that all requests for copies of company documents be in writing. A standard document request format should be established and should contain at least the following information:

1. Who is the requester
2. To whom the request is made
3. Identity of the document (in company terms if possible)
4. Company document number
5. Date of request
6. Priority for response
7. Internal I.D. number
8. Date request fulfilled
9. Comment section (did the response fulfill request).

It is noted that there is no universal language used to identify documents. Different companies have different names for the same type of document. It is therefore essential to clearly communicate what information is needed and desired prior to writing the request. The document requests should be in duplicate: one copy for the company and the other to be retained in the case file. Policy and procedure directive #17 – *Classification & Handling of Data & Physical Items Acquired from Employers*, provides guidelines for the processing and storage of documents that may be considered trade secrets.

Prior to the documents actually being received, a filing system should be developed. The system should be secure, accessible to all team members and ensure that individual documents are easily retrievable. The administrative support person could manage the filing system to ensure its continued effectiveness. **NOTE:** Only appropriate documents should be maintained in the filing system; field notes, document clips, and document review/evaluation notes should remain with the field notes.

Exhibit 2 contains a list of those documents most commonly requested. It is divided into two sections: Pre-Unit Selection and Unit-Specific Documents.

INSPECTION FACILITIES

The PSM team needs a suitable work area/command center from which the inspection can be conducted and coordinated. In most cases PSM inspections conducted by Oregon OSHA will occur in areas close to an Oregon OSHA field office. In these cases the inspection work area/command center will be established at the field office. Where this is not the case, except in the most unusual of circumstances, the company will provide the requisite onsite space. Almost any room will suffice, providing it meets some basic requirements.

The work area must be secure 24 hours a day with access limited to the inspection team and those company officials who would respond in an emergency. This is important so as to preclude taking boxes of documents and equipment in and out each day.The room should have sufficient desks or tables for reviewing documents and writing the report. Provisions should be made for communications. The team should have a portable cellular phone -- one phone as a minimum. Where cellular phone service is not available, one phone line provided by the employer is acceptable. In this case, team leader must make arrangements to reimburse the employer for the cost of phone calls.

Sufficient power outlets should be available for charging pumps, batteries and other inspection equipment.

The inspection team will need copies of a number of documents. It is hoped that the company would provide copying services or the use of a copy machine. The administrative support person could make the copies should the company not provide these services.

If the inspection is to be conducted at a remote site such that the field office cannot be used as the command center, the team leader must determine as soon as possible, what -- if any -- of the necessary facilities the company will provide. If the company does not provide all of the necessary facilities voluntarily, or puts disruptive restrictions on their use, the enforcement manager should be contacted as soon as possible so that alternate facilities can be arranged. This may result in the use of a rented copier and office space.

INSPECTION EQUIPMENT

Upon entry to the site, the inspection team should be fully prepared with all necessary inspection equipment and personal protective equipment. **Exhibit 3** contains a list of equipment that may be useful to prepare for the inspection. In addition, an inspection "kit" is outlined which can be used to set up a command center outside the field office. Some of the items in the "kit" may appear to be trivial; however, all of these items will be needed at some time during the inspection. It may not be practical to go back and forth to the office or a store to get these items, particularly if the inspection site is in an extremely remote location. The administrative support person would be responsible for maintaining adequate supplies throughout the inspection.

CRITICAL INSPECTION AREAS

It is essential that team members have specific subjects and areas to investigate. The team leader, with input from the team members, should assign the inspection areas prior to entry. This will help to avoid confusion and duplication of effort. In addition, the team members will be able to be better prepared for their individual tasks.

As inspection subjects are completed, the information should be reviewed with the team leader before going on to the next assignment. The state of compliance or noncompliance within any given area may require the team leader to modify the assignment list so as to make the most of the resources available.

CONTRACTORS

Contractors are an integral part of any PSM inspection. There may be only a few contractors or dozens, with several hundred contract employees, depending on whether the facility is undergoing a shutdown or turnaround.

It is imperative that, upon entry, the scope of the contractor activity be determined. The construction specialist on the team will have to formulate an inspection plan and set appropriate priorities. It is not the intent of the PSM inspection to inspect all outside contractors that are on-site, rather to inspect only those contractors who may be exposed to, or could cause or be affected by a catastrophic incident. Food service workers, certain janitorial employees and similar activities would not normally be inspected. Remote construction projects not associated with catastrophic potential would not necessarily be inspected.

The term "contractor" is not limited to construction type activities. Many chemical facilities use contract maintenance workers, vessel and piping inspectors, vessel heat treating, cleaning, engineering and similar non-construction contractors who remain at the facility year round or are called in at regular intervals. They are used to supplement existing plant personnel for regular duties and for special projects.

A shared responsibility for both contractors and company is quality assurance. It is essential that all materials and workmanship meet engineering standards. There should be sufficient checks to ensure that materials, such as the proper alloy or carbon steel pipe is used, and that the studs or bolts are of the proper size and grade. This is especially important in contractor supplied materials.

CRITICAL EXPERTISE

Situations may arise in PSM inspections that are beyond the technical expertise of the team members. A list should be developed identifying Oregon OSHA personnel or private sector experts and how they may be contacted. Areas where this expertise may be needed are:

1. Pressure equipment
2. Fire protection (fire brigades)
3. Facility siting
4. Emergency medical services
5. Hazardous waste operations
6. Dispersion modeling & incident command centers
7. Process hazard analysis/HAZOPS
8. Process chemistry
9. Industry practice

By no means is this list all-inclusive. It must be modified as needed to reflect current technology and hazards.

DOCUMENTATION

In order to withstand the probable legal challenges, all items must be thoroughly documented. Since the team will be made up of journey and senior-level CSHOs, good documentation is to be expected. All Oregon OSHA forms must be complete and legible. Shortcuts for employer knowledge such as "should have known" or "reasonable diligence" are not acceptable. Appropriate company documents, such as logs, procedures, permits, should be referenced for the particular violation.

Photographic documentation, either still camera or videotape, should be reviewed as soon as practicable to ensure that the condition or violation is appropriately depicted. Retake any photos or videos that are not good quality.

CASE FILE AND REPORT PREPARATION

A PSM inspection will take weeks or months of onsite activity and will generate a large amount of paper, both in field notes and documents. It is essential that the paper flow be organized and well maintained. This will result not only in a more efficient onsite survey, but will greatly reduce the write-up time.

A daily log, either manual or computer generated, should be maintained indicating the team members onsite, daily activities, meetings, problems, or other details, as necessary. Where violations are observed, they should be documented with the employees exposed, the date, time, location and management representative who accompanied the CSHO. Each instance of a violation should be separate. Where multiple violations are noted, the appropriate instance and corresponding documentation is needed. Alleged violation descriptions should be written as soon as practicable, while the hazard is fresh in the mind of the CSHO. Multi-employer policy citations must be coordinated with respect to exposing, controlling, correcting and creating employers' files.

Case file structure and organization must begin prior to entry into the facility. All documents must be logged and an index (computer preferred) generated, indicating the subject matter, document identification number, file number and the location of the document (box number). This is essential, as these documents may have to be referenced or retrieved many times during the course of the inspection and the review process. A data base management program for the PC's would be extremely beneficial. Computer disks should be backed up daily, or more often as necessary. The photos and videotape taken during the inspection should be properly identified with photographer, date, roll or tape number and subject. They should be kept in a separate file.

EXHIBIT 1

PRE-INSPECTION PREPARATION

A. Previous Oregon OSHA and OSHA history - nationwide search
   1. All citations or reports
   2. Litigation results
   3. Outstanding issues, items in contest
   4. Health response team reports
   5. NIOSH evaluations if any

B. DEQ and EPA history
   1. Reportable releases
   2. Reports of any kind
   3. Complaints and pending actions

C. Other Agency histories - Local/State/Federal
   1. Dept. of Transportation
   2. Coast Guard
   3. Federal Emergency Management Agency
   4. State Fire Marshal
   5. State Boiler and Pressure Vessel
   6. Oregon Dept. of Agriculture

D. Previous OSHA PSM inspection results
   1. Citations
   2. team members & expertise
   3. settlement agreements or litigation results

E. Identify contact people ─ other jurisdictions (Such as EPA, DEQ, DOT, ODOT, Coast Guard.)

F. Acquire necessary codes or standards (For example, applicable ASME, API, ANSI, and NFPA.)

INSPECTION STRATEGY

A. Identify critical needs and expertise

B. Select team members

C. Identify expertise within the team

D. Identify critical inspection areas

E. Assign areas according to expertise

F. Identify areas lacking expertise
   1. Provide training
   2. Bring in additional resources

G. Develop a tracking system for documents

H. Develop a daily log of on-site activities

I. Identify known scheduling conflicts (team members or employer)

J. Develop weekly schedule of activities
   1. Travel, write up, start/stop times
   2. Employer/employee and field office updates

PLANNING AND SCHEDULING

A. Create a Projected Time Line
   1. Projected records and program review time
   2. Projected walk-around time
   3. Projected write-up time

B. Resource Scheduling
   1. Team leader and construction specialist enter first for program and records review; present document request list.
   2. Full team enters following acquisition of requested documents for program/record review & walk-around
   3. Expert assistance enters as needed

C. Equipment Acquisition
   1. Required PPE
   2. Technical equipment

EXHIBIT 2: DOCUMENT REQUEST LIST

PRE-UNIT-SELECTION

A. OSHA 300 logs for past 3 years
   1. Employer
   2. Contractors

B. Incident reports
   1. Near miss
   2. Fires
   3. All releases (cross check with DEQ and EPA documents)

C. Site plan/Facility overview

D. Simplified flow diagrams

E. All permit procedures
   1. Confined space
   2. Hot work
   3. Others

F. Hazard communication

G. Overall emergency response plan (emergency action plan, evacuation plan)

H. Lockout/Tagout

I. PPE plan/Requirements

J. Audits
   1. Internal
   2. Corporate
   3. Contracted
   4. Insurance/Consultant

K. Fire brigade records
   1. Organizational statement
   2. Training records
   3. Callouts/Responses
   4. Roster
   5. Equipment inspection

L. Respirator program and inspections (emergency use)

M. Infection/Exposure control program (Bloodborne)

N. Safety and health outline
   1. Minutes of safety and health committee meetings and walk-around reports
   2. Committee roster

O. Disaster preparedness program

P. Facility description
   1. Size, capacity, age (units)
   2. History

Q. Turnaround/Shutdown schedule (not turnaround plan)

R. Safety and health complaints

S. Accident investigation logs

T. Industry hazard alerts (fire and explosion information from other facilities) ("Lessons Learned" by American Petroleum Institute)

U. Process hazard analysis scheduling procedure

UNIT-SPECIFIC DOCUMENTS

A. Written operating procedures
   1. All current procedures
      a. Normal
      b. Abnormal
      c. Emergency

   2. Startup procedures
      a. Partial (swoop down procedures)
      b. Full (cold)

   3. Shutdown procedures
      a. Normal
      b. Emergency

   4. Upset conditions (beyond normal operating parameters)

B. Process safety information (PSI)
   1. Process chemistry
   2. Capacity (volume)
   3. Operating temperatures and pressures
   4. Alarm settings (for example: high, high-high, low, low-low,)
   5. Operating parameters
   6. Consequences of deviations
   7. Flow rates

C. Operating logs (past 6 months)
   1. Foreman
   2. Operator
   3. Manual and Computer

D. Piping and instrumentation diagrams (P&IDS)
   1. Working (unit level) **NOTE: Must be current**
   2. Archival
   3. Simplified (detailed, at a later date)
   4. Product
   5. Utility
   6. Fire protection

E. Training records
   1. Operator and supervisory

2. Training records (summary) for all safety and health programs
    a. Hazard communication
    b. Emergency response
    c. Bloodborne pathogens
    d. Respirators, SCBA and other PPE
    e. Fire
    f. Other

F. Permits for the units (For example: Hot work, permit-required confined space,)

G. Pressure vessel records
1. For at least 20 different vessels --selection based on age, pressure, temperature, toxic or corrosive chemical involved (such as sulfuric acid)-- review repair history, or history of environmental stress cracking

2. Inspection records
    a. All previous records
    b. Analysis of defects
    c. Nondestructive testing records
    d. Inspection schedule and frequency
    e. Internal
    f. External
    g. On-stream
    h. Special
    i. American Society of Mechanical Engineers U-1 and U-2 records

3. Inspector qualifications
    a. American Society of Nondestructive Testing (ASNT) or equivalent levels (1, 2, or 3)
    b. Roster of inspectors
    c. Training history and documentation

4. Pressure relief valve (PRV) inspection records

5. Selection criteria for PRV's, vessels,

H. Unit plot plan detailed

I. Instrumentation calibration records

J. Unit emergency response/Action plan

K. Control room blueprint and schematic

L. Work orders
1. Outstanding
2. Obtain a sample of completed work order

3. Written work order procedure
4. All available safety work orders

M. Environmental sampling records
   1. Noise
   2. Air contaminants/Toxins
   3. Asbestos

N. Product sampling procedures

O. Calibration records for IH sampling equipment

P. Pre-startup review

Q. Rotating equipment inspection records
   1. Schedule
   2. Repair records

R. Operator certification

S. Flare system diagram (Piping and Instrument Diagram (P &IDs))

T. Process hazard analysis (PHAs) (Haz-Op, What If)

U. Piping inspection program
   1. Records/Results
   2. Schedule
   3. Inspector qualifications

EXHIBIT 3: INSPECTION EQUIPMENT

PERSONAL PROTECTIVE EQUIPMENT

A. Standard PPE per directive
   1. Safety shoes
   2. Safety glasses with side shields
   3. Hard hat
   4. High Visibility Vest

B. Site specific PPE
   1. Hearing protection
   2. Respirators with proper filters/cartridges

C. Flame retardant clothing/coveralls

D. Emergency escape packs, where necessary

E. Supplied-air respirators (if Oregon OSHA policy regarding their use is changed and then only for CSHOs who have received approved training within time frames as per the Oregon OSHA Respiratory Protection Program)

SAMPLING EQUIPMENT

A. Any applicable direct reading instrumentation: Oxygen Meters, 4 way gas meters, PID, Formaldehyde, etc.

B. Noise dosimeters

C. Appropriate sampling media for any chemical compounds without direct reading capacity

D. Bulk Asbestos sampling supplies: bags, tongs, gloves, respirator, water & soap mixture and spray adhesive

TECHNICAL EQUIPMENT

(a) Cameras, video cameras and digital recorders – (Check policy of inspected company regarding use)
- Each CSHO inspection team equipped with a camera ,recorder
- Intrinsically safe, if necessary
- Maintain careful log for each device (who, when, where, what)
- Extra batteries/ chargers.

(b) Audio files – (Check policy of inspected company regarding use)
1. Primarily for interviews or field notes
   Original digital files must be retained in media system
2. Audio files must be identified with date, team member, and subject matter
3. Transcription (as needed)

INSPECTION KIT

A. Office and miscellaneous supplies, as needed. (Such as , color markers, tape, stapler, magnifying glass, post-it notes, binder clips, file folders; flashlight, binoculars.)

B. Inspection Supplies and reference materials
1. Oregon OSHA forms
2. Access to internet for 1910.119 Process Safety Management and other 29 CFR regulations
3. OTI-PSM (Courses 330/340) manuals
4. Compliance Officer Guide
5. Industry Standards related to the process chemical(s), such as API, ASHRAE, IIAR, NFPA, ANSI, Chlorine Institute

APPENDIX D

Oregon OSHA Policy Document: October 15, 2010 Letter to large quantity suppliers of agricultural anhydrous ammonia.

(Issued) October 15, 2010

The purpose of this letter is to advise you that agricultural farm supply businesses having large quantities of anhydrous ammonia at their principal place of business(s) may fall under the rule requirements for Process Safety Management (PSM) 1910.119. The threshold quantity for this rule to apply is 10,000 pounds or 1,943 gallons of anhydrous ammonia.

The PSM rule has a limited retail establishment exemption based on federal OSHA's conclusion that these facilities do not present the same degree of hazard to employees as other workplaces covered by the standard. When the standard was adopted, the discussion in the preamble stated that this decision was made because chemicals in retail facilities are in small volume packages making a large release unlikely. In the case of farm supply merchants, the anhydrous ammonia is frequently stored in large tanks rather than small volume containers making a release a more significant event. Oregon OSHA has determined that these facilities are not part of the retail exemption.

PSM is a complex standard with requirements intended to prevent or minimize the consequences of catastrophic releases of highly hazardous chemicals. The requirements include: employee participation, written process safety information, process hazard analysis, written operating procedures, employer responsibilities for contractors and contract employer responsibilities, pre-startup safety review, mechanical integrity of process equipment, hot work permit, written procedures to manage change, incident investigation, compliance audits, and trade secrets.

Appendix C in the rule lists guidelines and recommendations to help employers and employees comply with these requirements. For more information on the PSM rule, please go to our website at osha.oregon.gov
Oregon OSHA's consultation staff can assist you in determining whether you fall under the PSM standard and help you take steps to meet the above requirements and ensure the safety of your employees. Oregon OSHA consultative staff are available at the following locations:

Portland: 503-229-6193	Salem: 503-373-7819	Eugene: 541-686-7913
Bend: 541-388-6068	Pendleton: 541-276-2353	Medford: 541-776-6016

Sincerely,

Marilyn K. Schuster
Policy Manager

APPENDIX E
References for compliance with the PSM Standard

A. 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Final Rule; February 24, 1992, Federal Register Vol. 57, No. 36, pp. 6356-6417 (including Preamble.)

B. CPL 03-00-021 PSM Covered Chemical Facilities National Emphasis Program (January 17, 2017) NOTE: 03-00-014 Canceled.

C. MOU – EPA (S-10) DEQ/OSFM/EPA/Oregon OSHA Sharing of information related to Section 112(r) of the Clean Air Act (CAA) and Risk Management Program (RMP) activities in Oregon.

D. Oregon OSHA Field Inspection Reference Manual (FIRM)

E. OSHA Instruction CPL 2.94, July 22, 1991, OSHA Response to Significant Events of Potentially Catastrophic Consequence.

F. OSHA Instruction ADM 1-1.12B, December 29, 1989, Integrated Management Information System (IMIS) Forms Manual.

Oregon Office of State Fire Marshal (OSFM) Hazardous Substance Information System (HSIS)

G. OSHA Instruction CPL 2-2.45, Sep. 6, 1988, Systems Safety Evaluation of Operations with Catastrophic Potential.

H. "Safety and Health Program Management Guidelines," 1989; U.S. Department of Labor, Occupational Safety and Health Administration.

I. "Safety and Health Guide for the Chemical Industry," 1986, (OSHA 3091); USDOL, OSHA.

J. "Review of Emergency Systems," June 1988; U.S.E.P.A., Office of Solid Waste and Emergency Response, Washington, DC 20480.

K. "Guidelines for Hazard Evaluation Procedures," Center for Chemical Process Safety of the American Institute of Chemical Engineers; 345 East 47th Street, New York, NY 10017.

L. "Plant Guidelines for Technical Management of Chemical Process Safety," Center for Chemical Process Safety (CCPS) of The American Institute of Chemical Engineers (AICHE).

M. "Guidelines for Safe Storage and Handling of High Toxic Hazard Materials," AICHE, CCPS.

N. "Guidelines for Vapor Release Mitigation," AICHE, CCPS.

O. "Process Safety Management (Control of Acute Hazards)," Chemical Manufacturers Association (CMA).

P. "Evaluating Process Safety in the Chemical Industry," Chemical Manufacturers Association; 2501 M Street NW, Washington, DC 20037.

Q. "Safe Warehousing of Chemicals," Chemical Manufacturers Association.

R. "A Managers Guide to Reducing Human Errors Improving Human Performance in the Chemical Industry," Chemical Manufacturers Association.

S. "Improving Owner and Contractor Safety Performance," API Recommended Practice 2220.

T. "Management of Process Hazards," American Petroleum Institute (API) Recommended Practice 750, First Edition, January 1990; 1220 L Street NW, Washington, DC 20005.

U. "Sizing, Selection, and Installation of Pressure Relieving Devices," Part 1, July 1990, API RP 520.

V. "Guide for Pressure relieving and Depressuring Systems," Nov. 1990, API RP 521.

W. "Avoiding Environmental Cracking in Amine Units," Aug. 1990, API RP 945.

X. "Pressure Vessel Inspection Code: Inspection, Rating, Repair, and Alteration," June 1989, API STD 510.

Y. "Inspection of Piping, Tubing, Valves, and Fittings," API RP 574.

Z. "Prevention of Brittle Fracture of Pressure Vessels," API RP 920.

AA. "Accident Investigation * * * A New Approach," 1983, National Safety Council; 444 North Michigan Avenue, Chicago, IL 60611-3991.

BB. "Fire & Explosion Index Hazard Classification Guide," 6th Edition, May 1987, Dow Chemical Company; Midland, Michigan 48674.

CC. "Chemical Exposure Index," May 1988, Dow Chemical Co.

DD. "Pressure Vessels, Section VIII," The American Society of Mechanical Engineers (ASME).

EE. "Chemical Plant and Petroleum Refinery Piping," ASME B31.3.

FF. "Personnel Qualification and Certification in Nondestructive Testing," American Society of Nondestructive Testing, Recommended Practice No. SNT-TC-1A.

GG. "Prevention of Furnace Explosions/Implosions in Multiple Burner Boiler Furnaces," National Fire Protection Association, NFPA 85C.

HH. "Purged and Pressurized Enclosures for Electrical Equipment," NFPA 496.

II. "Spacing of Facilities in Outdoor Chemical Plants," Factory Mutual Loss Prevention Data Sheet, 7-44.

JJ. "Chemical Process Control and Control Rooms," Factory Mutual Loss Prevention Data Sheet, 7-45.

KK. "National Board Inspection Code, A Manual for Boiler and Pressure Vessel Inspectors," The National Board of Boiler and Pressure Vessel Inspectors, 1992.

LL. Gideon, James A., and Thomas W. Carmody, "Process Safety Management: Resources from the American Institute of Chemical Engineers for Use by Industrial Hygienists," American Industrial Hygiene Association Journal (53), June 1992.

MM. May 11, 2016 Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of RAGAGEP IN PROCESS SAFETY MANAGEMENT ENFORCEMENT (Full text in Appendix F to this Program Directive.)

NN. July 18, 2016 Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the subject of PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS AND COVERED CONCENTRATIONS OF LISTED APPENDIX A CHEMICALS (Full text in Appendix G to this Program Directive.)

OO. April 30, 2018 Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of PSM RETAIL EXEMPTION ENFORCEMENT POLICY. (Full text in Appendix H to this Program Directive.)

Additional References on Explosives Manufacture:

A. Institute of Makers of Explosives Safety Library Publications, 1120 19th Street, N.W., Suite 310, Washington, D.C. 20036:

No. 1 Construction Guide for Storage Magazines

No. 2 The American Table of Distances

No. 3 Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials

No. 4 "Do's and Don'ts" Instructions and Warnings

No. 12 Glossary of Industry Terms

No. 17 Safety in the Transportation, Storage, Handling and Use of Explosives

No. 20 Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electrical Blasting Caps

No. 22 IME Standard for the Safe Transportation of Class C Detonators (Blasting Caps) In a Vehicle with Certain Other Explosives

B. Department of Defense (DOD) Standards:

DOD 5154.4S	DOD Ammunition & Explosives Safety Standards
DOD 4145.26M	DOD Contractor's Safety Manual for Ammunition, Explosives and Related Dangerous Material

C. National Fire Protection Association (NFPA) Codes:

NFPA 495	Code for the Manufacture, Transportation, Storage and Use of Explosive Materials
NFPA 77	Static Electricity
NFPA 78	Lightning Protection Code

Training Program Reference:

Synthetic Organic Chemical Manufacturers Association (SOCMA) Level I Chemical Process Operator Certification Training Trainee Manual, May 1990; NUS Corporation, Fossil and Industrial Training Services Department, 910 Clopper Road, Gaithersburg, MD 20877-0962.

APPENDIX F

May 11, 2016 Memorandum for Regional Administrators and State Plan Designees on the Subject of RAGAGEP IN PROCESS SAFETY MANAGEMENT ENFORCEMENT.

This enforcement policy addresses the Process Safety Management (PSM) Standard's recognized and generally accepted good engineering practices (RAGAGEP) requirements. Enforcement activity, including the *Petroleum Refinery Process Safety Management National Emphasis Program* (Refinery NEP), and requests for assistance from the field, revealed the need for this guidance. This memorandum rescinds and replaces the memorandum of the same title dated June 5, 2015. It is intended to be a clarification of the policy described in the earlier memorandum and does not reflect any substantive change in OSHA enforcement policy.

Background on Recognized and Generally Accepted Good Engineering Practices
The PSM Standard, 29 CFR 1910.119, directly references or implies the use of RAGAGEP in three provisions:

1. **(d)(3)(ii):** Employers must document that all **equipment** in PSM-covered processes complies with RAGAGEP;
2. **(j)(4)(ii): Inspections and tests** are performed on process equipment subject to the standard's mechanical integrity requirements in accordance with RAGAGEP; and
3. **(j)(4)(iii):** Inspection and test **frequency** follows manufacturer's recommendations and good engineering practice, and more frequently if indicated by operating experience.

In addition, **(d)(3)(iii)** addresses situations where the design codes, standards, or practices used in the design and construction of existing equipment are no longer in general use. In such cases, the employer must determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

As used in the PSM standard, RAGAGEP apply to process equipment design and maintenance; inspection and test practices; and inspection and test frequencies.

Examples of RAGAGEP

1. **Widely adopted codes**
   Certain consensus standards have been widely adopted by federal, state, or municipal jurisdictions. For example, many state and municipal building and other codes incorporate or adopt codes such as the National Fire Protection Association (NFPA) 101 *Life Safety* and NFPA 70 *National Electric* codes.

2. **Consensus documents**
   Certain organizations like the American Society of Mechanical Engineers (ASME) follow the American National Standards Institute's (ANSI) *Essential Requirements: Due process requirements for American National Standards* (Essential Requirements) when developing consensus standards and recommended practices. Under the ANSI and similar requirements, these organizations must demonstrate that they have diverse and broadly representative committee memberships. Examples of consensus documents include the

ASME B31.3 *Process Piping Code* and the International Institute of Ammonia Refrigeration's (IIAR) ANSI/IIAR 2-2008 — *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*. Such consensus documents are widely used as sources of RAGAGEP by those knowledgeable in the industry.

3. **Non-consensus documents**
   Some industries develop non-consensus engineering documents using processes not conforming to ANSI's Essential Requirements. Where applicable, the practices described in these documents can be widely accepted as good practices. For example, the Chlorine Institute's (CI) "pamphlets" focus on chlorine and sodium hypochlorite (bleach) safety and are used by some companies handling these materials. Note that OSHA also recognizes applicable manufacturer's recommendations as potential sources of RAGAGEP.

4. **Internal standards**
   The preamble to the PSM standard recognizes that employers may develop internal standards for use within their facilities. The preamble states, in relevant part:

The phrase suggested by rulemaking participants: "recognized and generally accepted good engineering practices" is consistent with OSHA's intent. The Agency also believes that this phrase would include appropriate internal standards of a facility.[(1)]

Internally developed standards must still represent *recognized* and *generally accepted good* engineering practices.

Reasons an employer might choose to follow internal standards can include:

1. Translating the requirements of published RAGAGEP into detailed corporate or facility implementation programs and/or procedures.
2. Setting design, maintenance, inspection, and testing requirements for unique equipment for which no other RAGAGEP exists.
3. Supplementing or augmenting RAGAGEP selected by the employer that only partially or inadequately address the employer's equipment.
4. Controlling hazards more effectively than the available codes and consensus and/or non-consensus documents when deemed necessary by the employer's PSM program.
5. Addressing hazards when the codes and consensus and/or non-consensus documents used for existing equipment are outdated and no longer describe good engineering practice.

In keeping with the performance-oriented nature of the PSM standard, employers select the RAGAGEP they apply in their covered processes. The examples of RAGAGEP noted above are not intended to reflect a hierarchy of RAGAGEP.

If an employer selects and follows widely adopted codes or consensus documents or widely adopted non-consensus documents for RAGAGEP, OSHA will accept such materials as RAGAGEP where applicable and appropriate.

If an employer develops and follows internal procedures, the compliance safety and health

officer (CSHO) should assess whether the internal procedures represent *recognized* and *generally accepted good* engineering practices. Like all employers complying with the PSM standard, an employer using internal procedures as RAGAGEP has an obligation under 1910.119(d)(3)(ii) to document that its equipment complies with recognized and generally accepted good engineering practices.

For technical help, consult with the Regional PSM Coordinator, a technical support engineer, or the PSM group at OSHA's Directorate of Enforcement Programs - Office of Chemical Process Safety and Enforcement Initiatives at 202-693-2341.

"Shall" and "Should" in RAGAGEP

"Shall," "must," or similar language used in RAGAGEP reflects the developer's view that the practice is a mandatory minimum requirement to control a hazard. Similarly, "shall not," "prohibited," or similar language references or describes unacceptable approaches or practices. If an employer deviates from an applicable "shall" or "shall not" requirement in the employer's adopted RAGAGEP, OSHA will presume a violation. In accordance with the inspection procedures described in Chapter 3 of OSHA's Field Operations Manual (CPL 02-00-159, Oct. 1, 2015), the employer will have an opportunity to explain the rationale for the deviation and why it believes its approach reflects recognized and generally accepted good engineering practices.

Use of the term "should" or similar language in RAGAGEP denotes a recommendation that reflects an acceptable and preferred practice. If a "should" provision in the employer's selected RAGAGEP is applicable to the covered process or particular situation, OSHA presumes that employer compliance with the recommended approach is acceptable.

If an employer selects RAGAGEP that contains "should" provisions, but does not follow them, OSHA will not presume a violation. In such cases, the CSHO should evaluate whether the employer's approach reflects recognized and generally accepted good engineering practices and whether the employer documented that its equipment complies with RAGAGEP. An employer does not need to document deviations from a "should" statement provided it documents that its equipment complies with RAGAGEP.

If an employer selects RAGAGEP that contains "should not" provisions (or similar language describing disfavored practices), and then follows the disfavored practices, OSHA will not presume a violation. In such cases, the CSHO should evaluate whether the employer's approach reflects recognized and generally accepted good engineering practices and whether the employer documented that its equipment complies with RAGAGEP. An employer does not need to document deviations from a "should not" statement provided it documents that its equipment complies with RAGAGEP.

For technical help, consult with your Regional PSM Coordinator, a technical support engineer, or the PSM group at OSHA's Directorate of Enforcement Programs - Office of Chemical Process Safety and Enforcement Initiatives at 202-693-2341.

"Normative" and "Informative" Requirements in RAGAGEP

Codes and consensus documents frequently contain appendices or annexes that provide supplemental information and/or requirements. The content of these appendices or annexes may be "normative" or "informative." "Normative" sections generally explain how to comply with the code and/or consensus document requirements and may contain both "shall" and "should" language. As discussed above, "shall" denotes the developer's view that the normative statement is mandatory, while "should" indicates a recommendation that reflects an acceptable and preferred practice. "Informative" sections generally provide background and reference information with respect to the code and/or consensus document requirements but may also identify and/or address hazards or acceptable means of abatement. Employers should read and consider these sections, but OSHA does not expect employers to consult all of the sources that are cited in an informative section or appendix. Again, for technical help, CSHOs should consult their Regional PSM coordinator, technical support engineer, or the Office of Chemical Process Safety and Enforcement Initiatives.

Enforcement Considerations

Under 1910.119, employers select the RAGAGEP with which their equipment and procedures must comply. In evaluating RAGAGEP compliance, CSHOs should be aware of a number of potential issues:

- There may be multiple RAGAGEP that apply to a specific process. For example, American Petroleum Institute (API), RP 520 *Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries Part II - Installation,* and International Standards Organization, Standard No. 4126-9, *Application and installation of safety devices*, are both RAGAGEP for relief valve installation and contain similar but not identical requirements. Both documents are protective and either is acceptable to OSHA.
- Employers do not need to consider or comply with a RAGAGEP provision that is not applicable to their specific worksite conditions, situations, or applications.
- Some employers apply RAGAGEP outside of their intended area of application, such as using ammonia refrigeration pressure vessel inspection recommended practices in a chemical plant or refinery process. Use of inapplicable RAGAGEP can result in poor hazard control and can be grounds for citations.
- There may be cases where the selected RAGAGEP does not control all of the hazards in an employer's covered process. As discussed above, the employer is expected to adopt other RAGAGEP (potentially including internal standards, guidance, or procedures) to address remaining process hazards. Whether internal standards constitute RAGAGEP should be reviewed on a case-by-case basis.
- An employer's internal standards may be more stringent than other relevant sources of RAGAGEP. More-stringent standards may be needed to adequately control hazards due to the unique characteristics of the employer's process. In all cases the employer must document that its equipment complies with recognized and generally accepted good engineering practices. Employers that meet the requirements of other applicable sources of RAGAGEP, but fail to comply with their own more stringent internal requirements, may be citable under other PSM provisions:

1. If there is a failure to follow more stringent internal Inspection & Test (I&T) procedures, consider citations under 1910.119(j)(2) for failure to implement their written I&T procedures
2. Process equipment may be outside acceptable limits defined in the employer's PSI. If so, consider citations under 1910.119(j)(5).
3. Additional or more stringent equipment safeguards may be specified by employers based on findings and recommendations from PHAs, Incident Investigations, or Management of Change procedures. Failure to implement or complete documented actions-to-be-taken may be cited under the relevant section of the Standard (e.g., 1910.119(e), (l), or (m)).

- Selectively applying individual provisions from multiple RAGAGEP addressing similar hazards might be inappropriate. Standard writing organizations develop their requirements as packages and mixing-and-matching provisions from multiple sources could result in inadequately controlled hazards. Internal standards that incorporate select provisions from different sources of RAGAGEP may in some circumstances be appropriate, or may be more protective than applying one source of RAGAGEP. This situation should be evaluated on a case-by-case basis. Consult the regional PSM Coordinator, regional engineering support, or the Office of Chemical Process Safety and Enforcement Initiatives if you are uncertain how to proceed.

- The PSM standard at 1910.119(j)(4)(ii) requires employers to follow RAGAGEP in establishing and implementing inspection and testing procedures. At 1910.119(j)(4)(iii), the standard provides that the frequency of inspections and tests of process equipment must be consistent with applicable manufacturers' recommendations and good engineering practices, and that inspections and tests must be performed more frequently if determined to be necessary by prior operating experience. CSHOs should review relevant documents, such as the employer's written inspection and test procedures (required under 1910.119(j)(2)), to determine the employer's selected RAGAGEP.

- In accordance with 1910.119(d)(3)(ii), employers must document that their covered process equipment complies with RAGAGEP (equipment built to older standards may come under 1910.119(d)(3)(iii), see paragraph 10 below). Equipment that does not comply with RAGAGEP cannot be documented as compliant. Therefore, both the failure to document compliance and the deviations from compliance with RAGAGEP can be the basis for citations under 1910.119(d)(3)(ii) (see procedures for combining and grouping violations in Chapter 4 of the Field Operations Manual (CPL 02-00-159, Oct. 1, 2015)). Note that the documentation requirement in 1910.119(d)(3)(ii) does not require the employer to document all of its engineering judgments.

  When writing 1910.119(d)(3)(ii) RAGAGEP-related citations, always cite the employer for **failing to document** compliance with recognized and generally accepted good engineering practices, describe the hazard, e.g., exposure of employees to fire, explosion, or toxic hazards, and reference the RAGAGEP selected by the employer. If the employer has not specified an applicable RAGAGEP, use "such as" language to reference an applicable source of RAGAGEP.

- Equipment covered under PSM's Mechanical Integrity provisions (listed in 1910.119(j)) that is outside acceptable limits, as defined by the process safety information (including RAGAGEP), is deficient under 1910.119(j)(5). Employers are required by this provision to correct deficiencies before further use or in a safe and timely manner when necessary means are taken to assure safe operation in the interim. If an employer fails to correct the deficiency before further use, or fails to assure safe operation and schedule a permanent correction timely, the failure may be cited under 1910.119(j)(5). If an employer has implemented interim measures and scheduled correction, additional investigation may be required to determine whether the employer has assured safe operation and the scheduled correction is timely. 1910.119(d)(3)(ii) and (j)(5) citations are often grouped. Consult your Regional OSHA support staff and/or SOL if you are uncertain if grouped citations are appropriate.

  Note, in the case where an employer is operating deficient equipment based on the use of interim safeguards pending final correction of the deficiency, the employer must develop and implement a management of change procedure for the continued safe operation of the equipment when required by 29 CFR 1910.119(l).

    - Older covered equipment may not have been designed and constructed under an applicable RAGAGEP because none existed at the time of design and construction. Alternatively, the equipment may have been designed and constructed under provisions of codes, standards, or practices that are no longer in general use. In such cases, 29 CFR 1910.119(d)(3)(iii) requires employers to determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner. Failure to do so may be cited under 1910.119(d)(3)(iii).

  When writing 1910.119(d)(3)(iii) citations, always cite the employer for **failing to determine and document** that the relevant equipment is designed, maintained, inspected, tested, and operating in a safe manner.
  If the employer has adopted an appropriate internal standard applicable to such older equipment, 29 CFR 1910.119(d)(3)(ii) requires the employer to document that the equipment complies with the internal standard. Failure to do so may result in a citation under 29 CFR 1910.119(d)(3)(ii).

    - When a 29 CFR 1910.119(d)(3)(ii) or (iii) citation is under consideration, it is important to establish and to document the age and installation date of the relevant process and equipment, and the dates and extent of process and equipment modifications, as well as the RAGAGEP selected by the employer, including the edition and publication date.

    - Organizations that develop codes and consensus and/or non-consensus documents may update them based on newly identified or recognized hazards; improved understanding of existing hazards; industry operating experience; and/or incidents indicating that more stringent hazard control is

needed. If the updated document explicitly provides that new clauses or requirements are retroactive, those updates are relevant to determining whether the employer's practice continues to conform to RAGAGEP. Where RAGAGEP are updated to be more protective but are not explicitly retroactive, PSM does not mandate that employers upgrade their equipment, facilities, or practices to meet current versions of their selected RAGAGEP. However, under 1910.119(d)(3)(iii), employers must determine and document that their equipment is designed, maintained, inspected, tested, and operating in a safe manner.

- Notify the Office of Chemical Process Safety and Enforcement Initiatives if you encounter sources of RAGAGEP that appear to have changed to be less protective or that are being interpreted by employers in a manner that is less protective. There have been times in the past when OSHA has determined that specific provisions in published guidance documents no longer reflect generally accepted and good engineering practices. Such determinations should only be made in consultation with the Office of Chemical Process Safety and Enforcement Initiatives.

- When writing 1910.119(j)(4)(ii) citations, always cite the employer for failing to follow RAGAGEP in its inspection and testing procedures, and reference the relevant RAGAGEP adopted / recognized by the employer. If the employer has not specified an applicable RAGAGEP, use "such as" language to reference an applicable source of RAGAGEP. When the employer's I&T procedures comply with RAGAGEP, but are not implemented or followed, consider 1910.119(j)(2) citations.

- When writing 1910.119(j)(4)(iii) citations, always cite the employer for not inspecting and/or testing process equipment at frequencies **consistent** with applicable manufacturers' recommendations and good engineering practices, **or more frequently** if indicated by prior operating experience, i.e., based on the condition of the equipment when previously inspected or tested.

- When writing RAGAGEP-related citations when the employer has not specified a RAGAGEP, CSHOs should be careful to reference in the citation's alleged violation description only RAGAGEP that are actually applicable to the equipment and process being inspected. CSHOs have sometimes referenced inapplicable API relief valve RAGAGEP in citations involving ammonia refrigeration processes.

FOOTNOTE:
1. PSM preamble accessed on January 15, 2013.

APPENDIX G

July 18, 2016 MEMORANDUM for Regional Administrators and State Plan Designees on the subject of PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS AND COVERED CONCENTRATIONS OF LISTED APPENDIX A CHEMICALS

From THOMAS GALASSI, Director Directorate of Enforcement Programs

Through DOROTHY DOUGHERTY, Deputy Assistant Secretary

This memorandum rescinds and replaces the memorandum of the same title dated June 5, 2015. It clarifies the earlier memorandum, provides additional guidance, and incorporates a new interim citation policy.

This memorandum describes OSHA's enforcement policy on the concentration of a chemical that must be present in a process for the purpose of determining whether the chemical is at or above the threshold quantity listed in Appendix A of the Process Safety Management of Highly Hazardous Chemicals (PSM) standard (29 C.F.R. § 1910.119). It was developed in accordance with the President's August 1, 2013, Executive Order 13650, *Improving Chemical Facility Safety and Security*.

OSHA's Current Enforcement Policy: Maximum Commercial Grade

The PSM standard applies to, among other things, "a process which involves a chemical at or above the specified threshold quantities listed in Appendix A to this section." 29 C.F.R. §1910.119(a)(1)(i). Appendix A lists 137 chemicals and gives the threshold quantity in pounds for each one. For 11 of the 137 chemicals, a minimum concentration is listed along with the chemical name.[1] The remaining 126 chemicals are listed without reference to any concentration. This has created an issue regarding whether the threshold quantities for Appendix A chemicals without listed concentrations apply only to the chemicals in their undiluted (pure) form, or to mixtures in which the chemicals are present at some concentration. Neither the regulatory text nor regulatory history contains guidance on this question.

Following the 1991 publication of the PSM Final Rule, OSHA issued a series of letters of interpretation and compliance directives on this subject. OSHA's initial position, stated in letters issued in December 1992 and April 1993, was that the threshold quantities in Appendix A "apply only to pure (or 'chemical grade') chemicals unless otherwise stated in the appendix."[2] But in another letter issued in June 1993, OSHA appeared to modify this position stating:

> The substances listed in Appendix A without specified concentration limits are intended to be covered by the PSM Standard at commercial grade percentages of purity because the commercial grade of most of the [highly hazardous chemicals] HHC's is approximately 99 percent purity. Many of the HHC's, if not actually at 99% purity, are only one to two percent less than 99

percent pure. For example, the commercial grades of acrolein and allyl chloride are 97 percent purity. Some of these HHC's are considerably less than 99 percent pure.[3]

In 1994, OSHA further refined its policy, stating that the chemicals listed in Appendix A without minimum concentrations are covered at "commercial grade" concentrations and higher. The letter defined "commercial grade" as "a typical maximum concentration of the chemical that is commercially available and shipped." OSHA also noted that an employer could determine the maximum commercial concentration by referring to any published catalog of chemicals for commercial sales.[4] OSHA PSM compliance directives issued during this period contain similar statements describing the agency's policy.[5]

OSHA's policy as set forth in these letters of interpretation is ambiguous on several key issues. First, it is not clear whether the threshold quantity of a chemical without a specified concentration must be accounted for under the standard if the commercial grade concentration is significantly less than 99 percent or the chemical is used in the process at a concentration that is greater or lesser than maximum commercial grade concentration. Second, it is not clear whether the threshold quantity of a chemical in a mixture (e.g., a solution containing the chemical and a solvent) includes only the weight of the chemical or includes the weight of the mixture as a whole.

These and other inconsistencies in OSHA's policy led to the dismissal of a criminal indictment in a case involving a 1999 explosion at Concept Sciences Inc. in Allentown, Pennsylvania. U.S. v. Ward, No. Crim. 00-681, 2001 WL 1160168, at *11-*17 (E.D. Pa., Sept. 5, 2001). The case involved the PSM standard's coverage of a process using a solution of hydroxylamine at a concentration of 86.5 percent. At the time, the maximum commercial grade concentration of hydroxylamine was 50 percent. The quantity of hydroxylamine in the process exceeded the threshold quantity in Appendix A only if the weight of the water in the hydroxylamine solution was included. The district court found that Concept Sciences' president, Chip Ward, lacked reasonable notice that the standard applied to the process because OSHA's interpretive guidance was ambiguous as to the concentration level at and above which hydroxylamine is covered. Id. at 9-12. The court noted that the June 22, 1993 interpretive letter could be read to mean that a process involving an Appendix A chemical without a specified concentration is covered by the standard only if the chemical concentration is near 99 percent purity. Id. at 12. The court also found that OSHA's interpretation letters were unclear whether the threshold quantity of a chemical in solution includes the weight of the solvent. Id. at 14-17. As a result of this lack of clarity, the court found that the standard could not be enforced against Ward in these circumstances.

OSHA's Reconsideration of the Maximum Commercial Grade Policy

Pursuant to E.O. 13650, OSHA undertook a critical review of its commercial grade policy to identify necessary changes. OSHA was concerned not only with clarifying the policy, but also assuring its consistency with the protective purposes of the standard. In particular, OSHA was concerned that the policy does not adequately account for the potential that the chemicals listed in Appendix A without specified concentrations may retain their hazardous characteristics even at relatively low concentrations.

In addressing this question, OSHA considered the Environmental Protection Agency's (EPA) experience in implementing provisions of the Clean Air Act Amendments of 1990 (CAAA) relating to the public health and environmental impacts of releases of hazardous chemicals. The CAAA required EPA to develop a list of substances that would likely be hazardous to the public or the environment if released, and promulgate regulations and guidance on the prevention and mitigation of such releases. Pursuant to

notice and comment procedures, EPA promulgated a List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention. 59 Fed. Reg. 4478-01 (January 31, 1994). EPA has also issued regulations requiring that regulated entities develop and submit Risk Management Plans (RMPs) which must include a hazard assessment, a prevention program, and an emergency response program. In promulgating the rule, EPA addressed the concentration at which a dilute solution of a substance may pose a hazard sufficient to require a determination regarding whether a threshold quantity is present in a process. 59 Fed Reg. 4488. EPA concluded that, for a few chemicals, it could determine specific cut-off concentrations below which the chemicals need not be considered in determining whether a threshold quantity is present. The remaining substances, EPA found, could reasonably be considered to be hazardous in concentrations at or above one percent, if present in a process at the threshold quantity, unless the partial pressure of the substance was less than 10 millimeters of mercury (10 mm Hg.). Ibid. Accordingly, the EPA rule includes a provision requiring that if a listed substance with no specified cut-off concentration is present in a mixture at a concentration of one percent or greater by weight, the threshold quantity of the substance must be determined unless the owner or operator can demonstrate that the partial pressure of the substance under all conditions in the process is below 10 mm Hg. 40 C.F.R. 68.115(b)(1).

OSHA believes that the one percent concentration cut-off established in the EPA rule is the appropriate policy on the concentration of an Appendix A chemical that must be present in a mixture before the threshold quantity of the chemical must be determined. Both the PSM standard and EPA's Risk Management Program are intended to prevent, or ameliorate the effects of, catastrophic releases of hazardous chemicals. EPA's conclusion, following notice and comment, that even one percent solutions of regulated substances may reasonably be anticipated to cause effects of concern in an accidental release is highly relevant. The current maximum commercial grade policy provides no clear threshold above which a chemical mixture is covered, and could permit dangerous concentrations of hazardous chemicals in mixtures to be exempted from PSM coverage.

The commercial grade approach is also confusing for employers attempting to apply the standard. To determine the commercial grade for an Appendix A listed chemical, employers must determine the maximum concentration at which the listed chemical is commercially available for industrial use. Although this can be done with catalogs or by contacting chemical suppliers, undertaking such a process can be difficult because it requires employers: (1) to know and understand the entirety of the supply chain for a particular HHC and (2) to make a determination as to the maximum commercial grade without a means of verifying whether the determination is correct.

OSHA's New Enforcement Policy: the One Percent Test

To better address the hazards associated with mixtures of Appendix A HHCs, OSHA hereby rescinds the maximum commercial grade or pure (chemical) grade policy and adopts a one percent test similar to that adopted by EPA. The new enforcement policy is as follows:

In determining whether a process involves a chemical (whether pure or in a mixture) at or above the specified threshold quantities listed in Appendix A, the employer shall calculate:

> (a) the total weight of any chemical in the process at a concentration that meets or exceeds the concentration listed for that chemical in Appendix A, and

(b) with respect to chemicals for which no concentration is specified in Appendix A, the total weight of the chemical in the process at a concentration of one percent or greater. However, the employer need not include the weight of such chemicals in any portion of the process in which the partial pressure of the chemical in the vapor space under handling or storage conditions is less than 10 millimeters of mercury (mm Hg). The employer shall document this partial pressure determination.

In determining the weight of a chemical present in a mixture, only the weight of the chemical itself, exclusive of any solvent, solution, or carrier is counted.

A few examples illustrate the new policy's application. If a process involves a 2000-pound mixture of 50 percent chloropicrin by weight and an appropriate solvent, the following formula determines coverage:

Weight x [concentration] = amount of highly hazardous chemical
2000 pounds x 50 percent = 1000 pounds chloropicrin
1000 pounds exceeds the 500-pound threshold quantity in Appendix A.

For a chemical with a listed concentration, the same formula applies. For example, if a process involves a 10,000 pound mixture of 70 percent diacetyl peroxide and an appropriate solvent, the calculation is a follows:

Weight x [concentration] = amount of highly hazardous chemical
10000 pounds x 70 percent = 7000 pounds of diacetyl peroxide
7000 pounds exceeds the 5000-pound threshold quantity.

But, in contrast, 5000 pounds of 70 percent diacetyl peroxide is not covered:

Weight x [concentration] = amount of highly hazardous chemical
5000 pounds x 70 percent = 3500 pounds of diacetyl peroxide
3500 pounds is less than the 5000-pound threshold quantity.

OSHA notes that where an entry in Appendix A is listed as "anhydrous," it does not cover aqueous solutions or aqueous mixtures. Anhydrous means "containing no water" or "without water." Thus, by definition, Appendix A to PSM does not cover aqueous solutions or aqueous mixtures of chemicals specifically listed as "anhydrous." In addition, although not specifically designated as "anhydrous," OSHA has interpreted Appendix A to mean that the PSM standard does not cover Hydrogen Chloride (CAS 7647-01-0) and/or Hydrogen Fluoride (CAS 7664-39-3) in aqueous solutions or aqueous mixtures.[6] Therefore, the following entries in Appendix A are not covered when in aqueous solutions or aqueous mixtures:

(1) Ammonia, Anhydrous (CAS 7664-41-7)[7];
(2) Dimethylamine, Anhydrous (CAS 124-40-3);
(3) Hydrogen Cyanide, Anhydrous (CAS 74-90-8);
(4) Methylamine, Anhydrous (CAS 74-89-5);
(5) Hydrochloric Acid, Anhydrous/ Hydrogen Chloride (CAS 7647-01-0); and
(6) Hydrofluoric Acid, Anhydrous/ Hydrogen Fluoride (CAS 7664-39-3).

In such cases, the listing in Appendix A covers only the anhydrous form of the chemical.

Furthermore, OSHA finds that aqueous mixtures of hydrogen bromide (at concentrations below 63%) and mixtures of alkyl aluminum (at any concentration) will fall within the partial pressure exemption under all normal handling and storage conditions.

Attachment A of this memorandum gives questions and answers to typical situations compliance officers may encounter in determining the concentration of an HHC for PSM coverage.

Effect of this Memorandum on Prior Guidance

OSHA hereby rescinds all prior statements (including statements in directives, letters of interpretation, and memoranda) related to Appendix A of the PSM standard to the extent they are inconsistent with the one percent policy. OSHA specifically clarifies that the following letters of interpretation are unaffected by this memorandum and are currently good statements of OSHA policy:

1. Letter of Interpretation to Frank Samartinov, June 24, 1992 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20717 --hydrochloric (muriatic) acid not covered by the PSM standard;
2. Letter of Interpretation to David Smith (Question 1 only), March 21, 1994 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21427 --hydrochloric (muriatic) acid not covered by the PSM standard;
3. Letter of Interpretation to Ernie Woody, Jan. 21, 1993 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20995 --hydrochloric (muriatic) acid not covered by the PSM standard;
4. Letter of Interpretation to Robert Rusczek, May 18, 1994 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21487 --aqueous solutions of hydrogen fluoride not covered by the PSM standard;
5. Letter of Interpretation to Gerald Lancour, Jan. 28, 1994 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21377--aqueous solutions of hydrogen fluoride not covered by the PSM standard;
6. Letter of Interpretation to Cary Franklin, June 28, 1992 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20727 --formaldehyde mixtures at concentrations below 37% not covered by the PSM standard;
7. Letter of Interpretation to Jon LaRue, June 24, 1993 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21180 --discussion of PSM coverage for sulfuric acid and oleum/fuming sulfuric acid.
8. Letter of Interpretation to Thomas Grumbles, March 25, 1992 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20603---hydrogen chloride/hydrochloric acid, anhydrous are the same substance.

Interim Enforcement Policy

Through March 31, 2017, OSHA will not cite any employers for violations of the PSM standard based on this memorandum (or the prior memorandum dated June 5, 2015). However, during this time period, PSM citations may still be issued based on the previous “commercial grade concentration” policy, under which OSHA considers the total weight of the chemical in the process at commercial grade concentrations and higher.

Through March 31, 2018, with respect to processes that will be covered by the PSM standard for the first time as a result of the one percent test, OSHA will make it a top priority for Compliance Assistance Specialists (CASs) in its Area Offices to provide assistance, when requested, to help employers bring such processes into PSM compliance. Eligible employers can also seek assistance from OSHA's On-site Consultation Program. To the extent relevant expertise is available among consultation program personnel, requests for assistance with these processes should be a high priority for receiving on-site consultation visits.

From April 1, 2017, through March 31, 2018, the following policies will apply with respect to processes that are covered by the PSM standard for the first time as a result of the one percent test:

1. OSHA will not conduct programmed inspections of such processes.
2. OSHA will not cite an employer under the PSM standard for any PSM violations involving such processes provided the employer is making good faith efforts to come into compliance with the PSM standard by March 31, 2018. OSHA will consider efforts made by employers to be "in good faith" if they can demonstrate that ongoing efforts to comply with the standard are underway and documented. This policy does not apply in cases involving a fatality or catastrophe.
3. Any citations involving PSM violations at such processes shall be submitted to the OSHA Regional Office prior to issuance to ensure consistency and clarity. For cases where the Regional Office needs assistance in its review, it shall consult with OSHA's Directorate of Enforcement Programs ¿ Office of Chemical Process Safety and Enforcement Initiatives.

Attachment A (to July 18, 2016 MEMORANDUM)

Question 1: A process comprises 1,000 pounds of a mixture containing ten percent diborane (CAS 19287-45-7) by weight. Is the process covered by PSM?

> OSHA Response: Yes. Ten percent by weight of 1,000 pounds is 100 pounds of diborane. The threshold quantity of diborane is 100 pounds, therefore the process is covered under PSM.

Question 2: A process comprises 10,000 pounds of 50 percent diacetyl peroxide solution. Is the process covered by PSM?

> OSHA Response: No. Diacetyl peroxide is specifically listed in Appendix A at concentrations greater than 70 percent. Therefore, solutions containing diacetyl peroxide at less than 70 percent are not covered by PSM regardless of the aggregate amount of the highly hazardous chemical.

Question 3: An employer shows that his process containing 11,000 pounds of a three percent HHC solution has an HHC partial pressure of 7mmHg. The threshold quantity of the HHC is 100 pounds. Is the process covered by PSM?

> OSHA Response: No. Although HHC is present at a concentration above one percent, and in a threshold quantity exceeding 100 pounds, the employer need not count the threshold quantity because it has shown that the partial pressure of the chemical in the process is less than 10

mmHg. To calculate this, the employer measures the vapor space pressure at 14.7 psia (760 mmHg) and determines, through analysis, that HHC makes up less than 0.9 mole percent of the vapor. Therefore, the HHC partial pressure is 760 mmHg x 0.009 = 7 mmHg.

Question 4: A portion of an interconnected process contains a mixture with less than one percent of the covered HHC. Does this mean that this portion of the process is not covered under PSM?

OSHA Response: No. An interconnected process is a single process for purposes of coverage under PSM; it is either covered or not covered based on whether the weight of one or more HHCs in any portion of the process meets or exceeds the threshold quantity (TQ) in Appendix A. In determining whether HHCs in any portion of an interconnected process meet or exceed the TQ, the employer need not count any HHC present in a mixture at a concentration less than one percent by weight. However, the employer must determine the total weight of any HHC in a mixture at a concentration of one percent or greater in any portion of the process, and if the total weight meets or exceeds the TQ, the process, as a whole, is covered.

In a similar fashion, the EPA RMP rule addresses the same concept. At 40 CFR 68.115(b)(1), EPA states that the covered material in the portion of the process where the partial pressure is less than 10 mmHg should not be counted towards the threshold quantity.

Footnotes:

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1. For example, “Diacetyl Peroxide (Concentration > 70%)”; “Hydrogen Peroxide (52% by weight or greater).” Appendix A.

2. Letter of Interpretation to Shari Roney, April 14, 1993 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21091.

See also Letter of interpretation to David L. Walker, December 21, 1992 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20963.

3. Letter of Interpretation to F.L. Lambert, June 22, 1993 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21176.

4. Letter of Interpretation to David B. Smith, March 21, 1994 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21427.

See also PSM Applicability to a 50% Solution of Hydroxylamine, April 30, 1999 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22736.

5. See the 1992 and 1994 PSM compliance directives (CPL 02-02-045) --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=1559 (1992) and http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=1558 (1994).

6. Hydrofluoric acid (specifically designated in Appendix A of the PSM standard as “anhydrous”) and hydrogen fluoride both are listed in Appendix A of the PSM standard with the same Chemical Abstract Number and threshold quantities. OSHA letters of interpretation state that anhydrous hydrofluoric acid and hydrogen fluoride are the same hazardous chemical. See Letter of Interpretation to Robert Rusczek, May 18, 1994 --available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21487.

Hydrochloric acid (specifically designated in Appendix A of the PSM standard as “anhydrous”) and hydrogen chloride both are listed in Appendix A of the PSM standard with the same Chemical Abstract Number and threshold quantities. OSHA letters of interpretation state that anhydrous hydrochloric acid and hydrogen chloride are the same substance. See Letter of Interpretation to Thomas Grumbles, March 25, 1992 --available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=20603. In accordance with these letters of interpretation, aqueous hydrochloric acid (also known as muriatic acid) and aqueous hydrofluoric acid are not covered by the PSM standard.

7. There is a separate entry in Appendix A for “Ammonia solutions (>44% ammonia by weight)”, which covers aqueous ammonia mixtures of greater than 44% concentration.

APPENDIX H

April 30, 2018 Federal OSHA Memorandum for Regional Administrators and State Plan Designees on the Subject of PSM RETAIL EXEMPTION ENFORCEMENT POLICY .

FROM: Thomas Galassi, Directorate of Enforcement Programs
THROUGH: Richard Mendelson, Acting Deputy Assistant Secretary

OSHA's process safety management (PSM) standard, which contains requirements for preventing or minimizing toxic, fire, and explosion hazards associated with catastrophic releases of toxic, reactive, flammable, or explosive chemicals, does not apply to "retail facilities." 29 CFR 1910.119(a)(2)(i). The PSM standard does not define the term "retail," and on September 23, 2016, the United States Court of Appeals for the District of Columbia Circuit invalidated a memo stating OSHA's interpretation of that term.1 In light of the D.C. Circuit's decision, the following PSM enforcement policy guidance applies:

OSHA will not issue citations under the PSM standard for employers in the following North American Industry Classification System (NAICS) codes:

- 424510 - Grain and Field Bean Merchant Wholesalers
- 424590 - Other Farm Product Raw Material Merchant Wholesalers
- 424910-Farm Supplies Merchant Wholesalers

OSHA expects employers in these industries to continue to comply with other applicable OSHA standards, including 29 CFR 1910.109(i) (storage of ammonium nitrate), 29 CFR 1910.111 (storage and handling of anhydrous ammonia), 29 CFR 1910.120 (hazardous waste operations and emergency response), and 29 CFR 1910.1200 (hazard communication). These standards are valuable agency tools to ensure the safety of workers in these industries. In particular, OSHA standard 1910.111 addresses similar types of ammonia hazards as the PSM standard. OSHA will seek to maximize compliance among the covered employers through strong enforcement.

For all other industries subject to PSM coverage, compliance officers should exercise enforcement discretion in accordance with the following explanation from the preamble to the PSM standard:

> With respect to the exclusion of retail facilities ... OSHA believed that such facilities did not present the same degree of hazard to employees as other workplaces covered by the proposal. Therefore, OSHA should not require a comprehensive process safety management system in addition to other applicable OSHA standards addressing flammable and combustible liquids, compressed gases, hazard communication, etc., for retail facilities…

> Certainly highly hazardous chemicals may be present in [retail] ... operations. However, OSHA believes that chemicals in retail facilities are in small volume packages, containers and allotments, making a large release unlikely. OSHA received few comments disagreeing with the exemption of retail facilities (e.g., gasoline stations). OSHA has retained the exemption in the final rule. 57 Fed. Reg. 6356, 6369 (Feb. 24, 1992).

Please direct questions to the Office of Chemical Process Safety and Enforcement Initiatives at (202) 693-1921.

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1 See Agricultural Retailers Ass'n v. US Dep't of Labor, 837 F.3d 60 (D.C. Cir. 2016).