Addressing Common PSM Audit Findings
Part 2 – Operating Procedure, Safe Work Practice, and Training Issues[1]

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Introduction

This is part 2 of a series addressing common process safety audit findings. Part 1 addressed safe limits and operating limits [1]. Part 2 addresses operating procedures, training, and safe work practices including hot work permits. Typical audit findings and how they can be avoided through appropriate understanding and implementation of the relevant regulatory requirements are provided.

As discussed in Part 1, process safety audits [2,3] are conducted for two main reasons:

(1) feedback on process safety program implementation and effectiveness to identify potential improvement opportunities for improved performance

(2) compliance with process safety regulations such as OSHA 29 CFR 1910:119 Process Safety Management (PSM) and the EPA 40 CFR 68 Risk Management Rule (RMP).

If a facility has process covered by these regulations, compliance audits must be conducted every 3 years.

Operating procedures (OPs) [3,4], the associated operator training, and the safe work practices (SWPs) governing hazardous work performed in facilities provide the basis for the daily, ongoing safe and consistent manufacture of desired products as intended by the process design, including appropriate evaluation and management of process risks. As discussed in Part 1 of this series [1], processing outside of the normal operating range can lead to process upsets, quality problems, productivity issues, and perhaps significant process safety incidents including loss of containment, personnel injury, and environmental harm. A lack of well-designed and comprehensive OPs can lead to these issues. Poor training of personnel in understanding and following OP requirements can also lead to these issues. Similarly, poor SWPs or poor use of and poor training on SWPs can result in similar situations.

Process safety audits assess if regulatory requirements and good industry practices have been followed in developing effective OPs/SWPs and if personnel have received, understood, and adhere to training on their required job tasks. This paper addresses several of the most frequent audit findings observed related to OPs, SWPs, and training and provides guidance on how appropriate implementation of requirements for these PSM elements can improve compliance and ultimately contribute to safe operations and manufacturing excellence. Typical audit finding are shown in Tables 1a/b/c.

Requirements/Background

OPs are developed to provide instruction on how process operations job tasks should be performed safely and reliably, consistent with the technical documentation provided in the process safety information (PSI) and the hazard and risk evaluation provided in the process hazard analysis (PHA). OPs typically define the specific operating tasks associated with the process, including the roles of operators, sequencing of job tasks, safety and health considerations, operating limits, and troubleshooting of potential operating problems. The relevant OSHA PSM requirements are shown in Table 2a. OPs must be developed for various operating phases as shown in Figure 1 and include specific information as shown in Figure 2.

Different approaches may be taken to meet these requirements, including:

- each requirement is met in every procedure (e.g., operating phases and limits are provided in every procedure)
- specific procedures are provided as part of an overall OP set or manual to meet the requirements (e.g., operating phases are provided in separate OPs intended to provide specific information and steps for the activities and limits are provided in a separate section (connected by references).

Some of these different approaches may reflect different operating needs, as related to batch, semi-continuous, and continuous operating modes. OPs must be reviewed as often as necessary to help ensure they are current, including changes evaluated as part of the management of changes (MOCs), and must be certified as current and accurate annually.

Figure 1 – OPs must include different operating phases

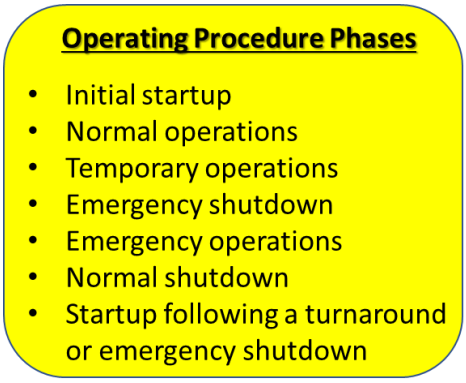
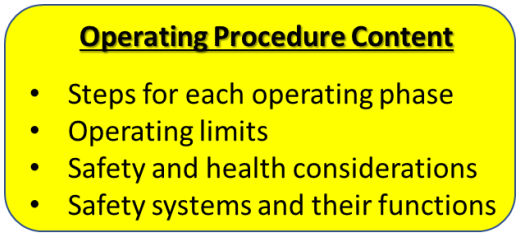
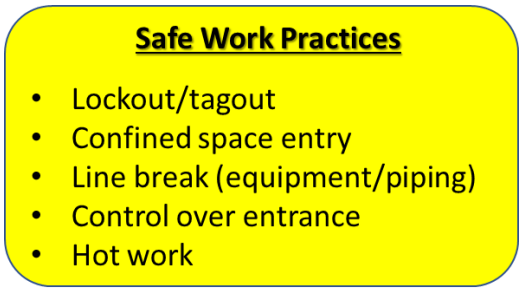


Figure 2 – OPs must include specified content



SWPs are developed to provide instruction on recurring, but non-routine tasks, to help ensure this type of work is conducted safely following established general procedures. The relevant OSHA PSM requirements are shown in Table 2b, and in some cases, additional OSHA standards may be available (e.g., OSHA 1910.146 for confined space entry). Typical SWPs as listed in the OSHA PSM regulation are shown in Figure 3. Note that we have included the OSHA Hot Work Permit element as part of other SWPs that OSHA lists in the OP requirements. Additional SWPs on a wide range of non-routine activities not listed in the OSHA PSM regulation should also be developed as needed at a facility, consistent with other OSHA regulations and effective occupational safety programs (e.g., OSHA 1910.179 for crane lifting) [3].

Figure 3 – OSHA PSM SWPs



Training is provided on OPs and on SWPS to develop personnel competency and consistency of operation. The relevant OSHA PSM requirements are shown in Table 2c. Training consists of:

- initial training to understand safe operating practices and requirements, including an overview of the process, safety and health hazards, emergency operations and shutdown, and safe work practices
- refresher training to help ensure that employees understand and adhere to the current OPs.

Differing approaches can be used to meet these initial training requirements. Most companies use extensive training checklists with written tests and/or field demonstrations to verify understanding and determine job qualifications. Some use outside training at community colleges or other locations to provide some of the initial training on facility hazards, emergency response, and safe work practices. Initial job training and qualification practices are often related to job progression requirements.

The approaches used for refresher training vary from requirements to review all current revisions of the OPs with written tests, interviews, and/or field demonstrations to less extensive OP reviews or testing. Refresher training must be provided at least every 3 years, with some companies accomplishing this in a short period of time while others schedule aspects of the refreshing training monthly or quarterly with completion over the 3-year timeframe. Employees must be consulted on the frequency of training to help establish effective refresher training schedules. For example, operators may believe that selected training should be conducted annually instead of once every three years. In all cases, proper documentation that training has occurred must be maintained. Finally, training must be documented and include the identify of the employee, the date of the training, and the means used to verify understanding.

Common Issues Observed in PSM Audits

Following are examples of some of the common issues with OPs, SWPs, and training that we have observed in PSM compliance audits:

1. **All operating phases are not explicitly addressed in OPs**

   As shown in Figure 1, the OSHA regulation and Good Industry Practice (GIP) clearly require/expect that each covered process will have OPs which address 7 operating phases. Some issues we often see in meeting this requirement include:

   a. When discussing “initial startup” procedures, we are often referred to “normal startup” procedures. The “initial startup” procedures are intended for the initial startup of the covered process, and are likely to include additional pre-commissioning activities and steps or for startup following a de-inventory of the entire process (e.g., as part of a big turnaround). The “normal startup” procedures referred to are typically addressing “startup following a

turnaround, or after an emergency shutdown." For example, batch processes may routinely be started-up daily and semi-continuous or continuous processes may start up routinely following normal shutdowns or scheduled maintenance. Of course, the initial startup may have occurred many years ago, and as a result, such procedures may no longer exist or may be archived/available in some fashion.

b. When we ask about or look for "normal operations" OPs, sometimes (1) there is a lack of clarity about what they should be, (2) the information is simply not available, or (3) the information is dispersed across multiple OPs. Normal OPs typically cover activities such as (1) daily field/board operator duties, including operator rounds/readings; (2) sampling; (3) troubleshooting; and (4) routine activities (e.g., switching filters or pumps). However, these are often not clearly labeled as "normal operations" procedures, and this could result in unnecessary attention during a regulatory inspection.

c. Some units have some OPs which represent "temporary operations" (e.g., routine bypassing of a piece of equipment that requires cleaning or maintenance) but these OPs do not always exist. The most common source of temporary OPs for most units is associated with temporary management of change (MOC) packages and there is no reference to this in the operating manuals or in the "procedure on writing and revising procedures" (if one exists).

d. When reviewing the emergency shutdown procedures, it is not uncommon to find that (1) the conditions under which emergency shutdown is required are not explicitly stated or are lacking and/or (2) the assignment of shutdown responsibility to qualified operators is not documented (e.g., by explicitly defining who does what for each OP step or section and clearly stating that only qualified operators can execute the emergency shutdown).

e. We often note that the differences between "emergency shutdown" and "emergency operations" procedures are not clearly defined/understood and (2) there are no references to the "corrective actions" included in the operating/safe limits tables as being part of the emergency operations procedures (see the OSHA guidance related to this in Part 1 of this series [1]). Typically, emergency shutdown procedures are those pertaining to immediate shutdown of a piece of equipment, process section, or entire process based on loss of containment or deviations outside of a safe upper/lower limit, while emergency operations procedures are those associated with loss of a utility, loss of the control system, shutdown of an upstream/downstream unit, or operation outside of an operating limit.

f. There are often no specific procedures for "startup after an emergency shutdown." For most units, the state of the process after an emergency shutdown will be different from the state after a normal shutdown. The subsequent startup would need to start with placing the system in the proper configuration for startup so that the normal startup procedures could be used, after appropriate checking of the process and equipment.

Guidance: Provide OPs for all required operating phases, with adequate detail to address the issues discussed above. In most cases, two best practices exist: (1) clearly-named individual OPs are provided for each operating phase and (2) all operating phases are clearly identified in each OP. If an operating phase is not relevant for the process, this should also be documented to avoid possible confusion or be seen as an oversight (e.g., initial startup).

2. **Safety and health considerations are not clearly and specifically addressed in OPs**

Industry practice is that OSHA's operating procedures requirements should be written in a way that ensures even the least experienced operator has clear instructions for safely operating the process. As such, it is important that they (1) are reminded of what chemical(s) they could be exposed to when executing each procedure and (2) have some combination of summary

information about the associated chemical exposure hazards and clear references to the safety data sheets (SDSs) and any other pertinent safety documents for further review. However, we often find one or both of these aspects lacking.

Conversely, we periodically find a large "Safety and Health" section in each procedure, which (1) is redundant, (2) develop "variances" between different OPs over time, and (3) may cause operators to "skip over" this section in order to get to the primary operating instructions. OSHA provides a clear list of items that should be included in the safety and health section but in many cases, this information is not organized, is hard to find during an audit, or is simply not provided (e.g., quality control of raw materials).

Guidance: Ensure that all required safety and health items are provided in the OPs. If an "umbrella" OP is used to document the required safety and health information, references to it should be made in the other OPs.

3. **Safety systems and their functions are not provided (or referenced) in OPs**

As shown in Figure 2, discussion of safety systems must be included in OPs to help operators (1) understand what safety systems exist in their process and (2) know how these systems function as well as actions they must take to activate a system when appropriate. However, even when there is adequate information about the safety systems and their design in the PSI, adequate information may not be summarized or referenced in the OPs, as required. There is often not enough information in the OPs to inform operators on how they should interact with each safety system (e.g., how do they activate fire protection if it does not automatically activate, how do they respond to one or multiple toxic or combustible gas detectors alarming), and appropriate thought should be given to providing the right level of detail. Also, the safety systems may not be a formal refresher training subject.

Guidance: Ensure that safety systems are discussed or referenced in OPs. In some cases, one OP may be provided to document multiple safety systems or a set of OPs or for a unit, OPs for safety systems can also be distributed among several OPs, as appropriate.

4. **OP review and certification process**

When we ask how often the OPs are reviewed, we can receive a variety of answers, including (1) "we review them annually as part of the certification," (2) "every three years as part of the refresher training schedule," or (3) "we review them when they are changed due to a management of change." The first response is beyond regulatory requirements since OSHA does not expect annual, in-depth reviews of all the procedures [5], although this can be a GIP depending on the overall scope. The other responses suggest that not all the procedures are being reviewed "as often as necessary" per the regulation. Involving all the operators in periodic procedure reviews as part of refresher training (see Issues #8 and #9) is helpful but is not regulatory. Review only by some operators and not including operations supervision or engineers may miss some actual operating practices and is a lost "employee participation" opportunity.

Even though the regulatory requirement for annual certification of OPs has been in place since 1992, we still too frequently find that implementation of this has eroded over the years and gaps exist in the certification documentation, sometimes for extended periods. Also, some new processes have been introduced without including a requirement for annual certification of the OPs. In many cases, certification documentation does not explicitly confirm the current revisions of the OPs are "current and accurate" or identify the process used to determine the status of the procedures.

Guidance: Ensure OPs are reviewed on a practical schedule, to support the 3-year refresher training schedule. Ideally, operators should lead or at least be involved in the review process to help ensure that the OPs reflect actual operating practices. OPs should be certified annually, providing documentation on the review process (along with use of the MOC system) used to keep them current.

5. **Non-compliance with regulatory requirements from associated SWP OSHA regulations**

Several of the SWPs referred to in the PSM regulations have their own internal audit requirements, as mentioned in the "Requirements/Background" section. There are 3 issues with these that we frequently find during compliance audits:

a. Sites are not complying with the OSHA 1910.147(c)(6)(i) requirement to "conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed." In some cases, we can find no evidence of any annual reviews. In many cases, there may not be "field" inspections or there may not be inspection of all the pertinent types of energy control procedures. OSHA considers periodic inspections to be a "hot" topic [6]. Potential reasons include personnel changes and/or management systems that may "erode" over time.

b. A majority of sites do periodic "permit audits" but some do not audit all the completed confined space entry (CSE) permits, as required by OSHA 1910.146(d)(14), within at least one year of the entry. In other cases, they regularly review their CSE procedure and permit form, but not all the completed CSE permits.

c. The hot work permit (HWP) nor the associated site procedure/training discuss all the pertinent fire prevention and protection requirements in OSHA 1910.252(a). Although listing all of these requirements on the HWP form may not be practical or necessary, it is certainly reasonable to go through the requirements and sources of the requirements during training on the site's HWP procedure. Periodic training for employees and contractors who use the HWPs and with personnel who authorize the permits should be provided.

Guidance: Ensure that non-PSM OSHA requirements for SWPs are met, in particular the requirements for periodic review of completed permit documentation. In addition, when additional training and audit requirements are built into corporate or site SWPs, ensure that these requirements are met consistently, since they will typically be reviewed by auditors/inspectors.

6. **Hot work permits do not consistently identify the object on which hot work is to be performed**

Many sites do a good on implementing the OSHA 1910.252(a) requirements associated with the hot work element. However, the additional PSM requirement to identify the "object" of the hot work is sometimes missed. When we review completed HWPs, there are usually some cases where this identification is not provided or is vague. Typical descriptions provided are often along the lines of "C Rx 3rd floor" (when the reactor is large and hot work hazards are different depending on which side is being worked on), "Fabricating New Water Line" (lacks any specific location or range), or "Weld Repairs on North Stairs" [not specifying at which level(s)]. In some cases, this may partly result from use of HWPs that do not include a specific "location" box on the form.

Guidance: Ensure that hot work permits and work control practices require identification of the specific location and object to be worked on. Periodically review completed hot work permits and require additional training as needed.

7. **Control over entrance (and exit) for the covered process units is not adequate**

Although most sites have procedures/practices covering control over entrance/exit of maintenance, support personnel, contractors, and other visitors to covered process units. However we often observe that the discipline of people following entrance procedures is lacking. Sign-in and sign-out logs are typically used with operator contact in the control room prior to entry to hazardous areas to help ensure that the required work can be conducted safely. It is not unusual to review logs or work permits and observe that workers did not sign in or out on during the task. Often, people sign in, but then fail to sign out, which could lead to unnecessary rescue efforts in an emergency. In some cases, entrance procedures may allow entry to an entire facility (for security), rather than entry into covered processes areas, which auditors should review carefully for effectiveness. Being allowed into a facility does not mean that visiting personnel should be able to enter hazardous process areas without following access control requirements.

Guidance: Develop procedures for entry into covered process areas in addition to typical security measures for entrance into the overall facility. Periodically review sign in and sign out logs and update them to help ensure they are being used correctly. Provide corrective training for violators as needed.

8. **Refresher training process issues**

Refresher training process and requirements are often not well-defined, and as a result may vary from unit to unit (or even shift to shift) and raise compliance issues or gaps vs. GIP. Some examples include:

a. The site has not specified which OPs require refresher training. This can result in variability and/or gaps in which procedures are reviewed during the 3-year refresher training cycle. Note that the regulatory requirement (see Table 2c) is to "assure that the employee understands and adheres to the current operating procedures of the process," but employers have latitude on how they accomplish this.

b. The frequency of OP reviews and/or the "depth" of such reviews may not be specified or may be lacking. In-depth vs. summary reviews can aid both OP reviews (see Issue #4) and the effectiveness of refresher training (see example c below).

c. Refresher training lacks clear documentation of the means used to verify understanding by the trainer/supervisor (particularly for training which does not include a test).

d. Documentation of the training for all operators is not available (e.g., operators out sick or on vacation may be missed).

Guidance: Develop and implement (or upgrade) the site PSM operator training guideline to specifically address how initial and refresher training are to be performed, including the differences between them, documentation of the site's basis for deciding which OPs require refresher training, and the depth of review required. For example, the decision on the depth/type of review required may be based on (1) identifying the "critical" OPs on a qualitative basis or (2) analyzing each OP based on frequency/criticality/difficulty and requiring refresher training or more frequent training on those with specified scores. Then, consider use of computer-based training or document review approaches to provide and document refresher training on "basic" OPs, with additional testing and/or field demonstrations on "critical" OPs to verify understanding/adherence. (See Issue #9 below for related information)

9. **Refresher training does not ensure that employees adhere to the current operating procedures**

   One of our focus issues the last few years has been the part of the regulatory requirement "to assure that the employee understands and adheres to the current operating procedures of the process" is often not addressed. Refresher training often (1) uses the same written tests (or subsets of the tests) used for initial training, (2) includes individual or group reviews of some procedures, and (3) some "what if" or "tabletop" drills on some training on operating/emergency scenarios. These practices can be useful to verify understanding of training for a group but not for individuals or on the specifics of the current revisions of the OPs. However, these methods are not sufficient to establish adherence to the OPs, especially for tasks that are done infrequently.

   Guidance: Provide a "demonstration of proficiency" component in the refresher training program in addition to written test verification of understanding to help provide adherence to the current OPs. For example, it can be useful to (1) identify the "critical" procedures for which refresher training to verify "adherence" will be required (typically startup, shutdown, emergency, and other critical procedures) and (2) require some amount of "field demonstrations" on these critical procedures (e.g., repeating some of the demonstrations used in initial training and/or demonstration of proficiency on some procedures ["what-if" or "tabletop" group simulation, monitored execution or simulation of some procedures]). Review the quality and results of written testing procedures. A true/false question format is likely less effective in establishing understanding of OPs and to emphasize the continuing adherence to OPs. While not required, periodic recheck of knowledge of the OPs can be useful as a GIP to evaluate the long term retention of training and help emphasize the adherence requirements (e.g., recheck 3 to 6 months after training). In addition, a focus on operational discipline programs [7] to promote continued adherence to OPs and other requirements and to evaluate gaps can also be used to evaluate, document, and improve overall adherence efforts.

10. **Lack of a process or documentation that employees are consulted on the appropriate frequency of refresher training**

    A common audit finding is that employees are not adequately consulted on the appropriate frequency of refresher training. Since refresher training cycles can be up to three years with some training repeated at shorter (annual) intervals, or where some training may be provided prior to each execution of a particular OP. Consulting with employees on the frequency of training on OPs or other topics at the 3-year time limit allows both experienced personnel and new personnel to provide input to the training process. In some cases, consultation on the frequency may have occurred at one point, but has not been sustained by repeated consultation (e.g., annually or at the 3-year refresher training limit). Refresher training may also be required "on demand" for infrequently performed tasks when they are scheduled (e.g., a unit shutdown/startup which only occurs on a 3-5 year frequency).

    Guidance: Consult with employees at least during each 3-year refresher training cycle on the frequency of refresher training and provide appropriate documentation of the input received. This can be done in a safety meeting, or can be included as questions on training checklists or tests to receive and document the employee feedback on training frequency. In addition, while not required, consultation with employees on the content and quality of refresher training materials and instruction can also provide feedback to improve the refresher training program.

Summary

Well-documented documented OPs and SWPs with associated effective training programs and practices are important foundations for safely and reliably operating potentially hazardous processes. Process safety regulations and industry best practices therefore require that:

- OPs be developed for different operating phases, be kept current, and contain clear operating instructions, operating limits, safety and health considerations, and safety systems descriptions and instructions.
- SWPs be developed for recurring non-routine tasks, such as lockout/tagout, confined space entry, line break, facility entry, and hot work
- Initial and refresher training on OPs and other operating and safety information be provided and documented to develop personnel capability and operational consistency.
- Periodic training be provided on SWPs and other safety procedures and information

Process safety audits continue to see poor understanding and ineffective implementation of these operating procedure and training requirements and on the requirements for SWPs.

We hope that the information provided in this paper will help you better evaluate these important parts of your PSM programs for improved regulatory compliance, continued safe operation, and in support of overall manufacturing excellence.

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References

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4 Center for Chemical Process Safety, Guidelines for Writing Effective Operating and Maintenance Procedures, 1996.

5 3/9/1994 OSHA Letter of Interpretation (https://www.osha.gov/laws-regs/standardinterpretations/1994-03-09)

6 https://www.osha.gov/dts/osta/lototraining/hottopics/ht-engcont-2-2.html

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Table 1a – Typical OP Audit Findings

Requirement	Audit Findings	Recommendations
1910.119(f)(1)(i) Steps for each operating phase.	OP-1: Many of the facility's operating manuals have not yet been updated, and some of the newly formatted operating manuals do not cover all of the operating phases. For the new manuals, the weakest areas are initial startup and emergency shutdown.	OP-1-R: As planned, complete the upgrade of the operating manuals to comply with the current guidelines as soon as possible. Also, review the initial startup and emergency shutdown procedures and ensure they are adequate.
1910.119(f)(1)(iii) Safety and health considerations.	OP-12 The SOPs reviewed do not consistently reference the SDSs for additional information on (1) properties and hazards of the process chemicals and (2) control measures to be taken if physical contact or airborne exposure occurs.	OP-2-R: Ensure the "Safety Keypoints" sections of the SOPs reference the SDSs for more information on (1) properties/hazards of the process chemicals and (2) control measures to be taken if physical contact or airborne exposure occurs.
1910.119(f)(1)(iv) Safety systems and their functions.	OP-3: Not all safety systems (e.g., interlocks, detectors, suppression systems, PSVs) and their functions are documented or referenced in the SOPs.	OP-3-R: Ensure that all applicable safety systems and their functions are documented or referenced in the SOPs; for example, by (1) developing a stand-alone procedure or operating manual section for each unit that provides this information and (2) referencing this procedure(s) in the individual SOPs.

Table 1b – Typical SWP Audit Finding

Requirement	Audit Findings	Recommendations
1910.119(k)(2) The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed.	HWP-1: Three of six recently completed safe work permits involving hot work did not adequately "identify the object on which hot work is to be performed."	HWP-1-R: Provide refresher training on the requirement that the "Scope of Work" section in the SWP needs to adequately identify the object on which hot work is performed. Also, consider updating the SWP form to emphasize this requirement.

Table 1c – Typical Training Audit Finding

Requirement	Audit Findings	Recommendations
[1910.119(g)(2)]. Refresher training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.	**TRN-1:** The facility has not provided and documented refresher training that ensures that each employee involved in operating the covered process understands and adheres to the current operating procedures.	**TRN-1-R:** Ensure there is documented refresher training on the process system operating procedures at least every 3 years to "assure that the employee understands and adheres to the current operating procedures." For example, include this in the annual (or periodic) operator training classes and tests and/or performing demonstrations of proficiency on these procedures or similar means.

Table 2a – OSHA 29 CFR 1910.119 (PSM) Requirements for OPs

1910.119(f) *Operating procedures.*
1910.119(f)(1) The employer shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and shall address at least the following elements.
1910.119(f)(1)(i) *Steps for each operating phase:*
1910.119(f)(1)(i)(A) Initial startup;
1910.119(f)(1)(i)(B) Normal operations;
1910.119(f)(1)(i)(C) Temporary operations;
1910.119(f)(1)(i)(D) Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner.
1910.119(f)(1)(i)(E) Emergency Operations;
1910.119(f)(1)(i)(F) Normal shutdown; and,
1910.119(f)(1)(i)(G) Startup following a turnaround, or after an emergency shutdown.
1910.119(f)(1)(iii) *Safety and health considerations*:
1910.119(f)(1)(iii)(A) Properties of, and hazards presented by, the chemicals used in the process;
1910.119(f)(1)(iii)(B) Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment;
1910.119(f)(1)(iii)(C) Control measures to be taken if physical contact or airborne exposure occurs;
1910.119(f)(1)(iii)(D) Quality control for raw materials and control of hazardous chemical inventory levels; and,
1910.119(f)(1)(iii)(E) Any special or unique hazards.
1910.119(f)(1)(iv) *Safety systems and their functions*.
1910.119(f)(3) The operating procedures shall be reviewed as often as necessary to assure that they reflect current operating practice, including changes that result from changes in process chemicals, technology, and equipment, and changes to facilities. The employer shall certify annually that these operating procedures are current and accurate.

Table 2b – OSHA 29 CFR 1910.119 (PSM) Requirements for SWPs

1910.119(f) *Operating procedures.* 1910.119(f)(4) The employer shall develop and implement safe work practices to provide for the control of hazards during operations such as lockout/tagout; confined space entry; opening process equipment or piping; and control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel. These safe work practices shall apply to employees and contractor employees. 1910.119(k) *Hot work permit*. 1910.119(k)(1) The employer shall issue a hot work permit for hot work operations conducted on or near a covered process. 1910.119(k)(2) The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.

Table 2c – OSHA 29 CFR 1910.119 (PSM) Requirements for Training

1910.119(g)
Training

1910.119(g)(1)
Initial training.

(i) Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in paragraph (f) of this section. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.

(ii) In lieu of initial training for those employees already involved in operating a process on May 26, 1992, an employer may certify 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.

1910.119(g)(2)
Refresher training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.

1910.119(g)(3)
Training documentation. The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.