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| Process Safety Management Program |
| **Title:** Compliance Guidelines for Pre-Startup Safety Review  **Document #:** PSM-SY-UN-016 **Issued:** 09/24/2014 |
| **Responsible Dept.:** EHS **Version:** New  **Approved By:** PSM Focus Group **Page:** 1 of 3 |

**1.0 Purpose:** This document summarizes the method The Pennsylvania State University uses to comply with the requirements relating to the Pre-Startup Safety Review (PSSR) Element of the Process Safety Management (PSM) Program.

**2.0 Scope:** The intent of this element is to define the requirements on when and how to conduct PSSR’s within the covered process areas. The PSSR is completed prior starting up new covered process areas and for modifications to existing covered process areas that are significant enough to require a change in the Process Safety Information (PSI). The PSSR represents field verification that the change was conducted the way it was designed and approved through the Management of Change (MOC) Element (#14).

**3.0 Guidelines:** Conducting the PSSR before starting or restarting the operation is important to ensure the as-built condition is the same as the design. In addition, it serves to verify that all associated process equipment is functional and operating properly, affected employees have been properly and thoroughly trained and that all process documentation and procedures are up-to-date prior to start-up of a process. For this to be successful, it must be conducted after the modifications have been completed.

The PSSR will be used by Penn State as a final check to confirm that:

1. Facility construction and process equipment have been installed in accordance with design specifications
2. Operating, Maintenance, EHS and Emergency procedures are in place and are adequate
3. Each employee involved with the operation of the covered process is adequately trained
4. All required process safety documentation is up-to-date and on file

The PSSR is to be completed through a team approach with individuals selected based on their knowledge, experience and responsibilities associated with the covered process area. At least one of the individuals conducting the review must be knowledgeable in the operation of the process. Participants in the PSSR are responsible to assess if the covered process can be started or re-started safely.

A PSSR will be conducted:

1. Prior to the startup of a new process covered by the University’s PSM Program
2. Restart of an existing covered process after a prolonged outage or as appropriate
3. After a significant modification that impacts the process safety information occurs to a covered process

To assist the PSSR Team in conducting their assessment, a standard review checklist will be used as a guide. This document will also serve as documentation that equipment is functional and operating properly, affected employees have been trained and that process documentation and procedures are available prior to start-up or restarting the process.

Any deficiencies identified through the PSSR should be remedied prior to the startup of the process. Issues associated with the safe operation of the process (e.g. safety interlock, equipment/personnel safe guard, etc.) must be corrected prior to startup. Documentation associated with the PSSR and any deficiencies including the implemented corrective action, will be maintained in the Process Safety Master File.

For existing covered process areas, a PSSR will be generated through the MOC process. To facilitate this link between elements, the MOC Form requires determination from the individual requesting a change if a PSSR is required (Section IV). Completion of the PSSR will also be noted on the MOC Form, including listing the individuals who conducted the PSSR.

The Process Safety Program Manager (PSPM) will maintain the appropriate documentation associated with completed PSSR’s. In addition, the PSPM will periodically evaluate select PSSR documentation to assess compliance to element requirements.

The Operations/Facility Manager is responsible for the PSSR program within their respective area(s) and assuring that they are completed prior to re-starting the covered process equipment or operation.

**4.0 Definitions:** The following definitions provide guidance regarding common issues surrounding the Pre-Startup Safety Review Element.

*Change* – any planned temporary or permanent change to an existing procedure, process or facility (whether hardware or software) which is not considered an “In-Kind Replacement”

*Covered Process* - any process where a highly hazardous chemical / biological agent or extremely hazardous substance deemed by Penn State is used, handled or stored. This also includes critical process operations identified by the University that would benefit from PSM program implementation.

*Pre-Startup Safety Review (PSSR)* – a technical review and inspection of equipment modification prior to startup to ensure that the modification has been installed in accordance with the approved design standards, that procedures are in place and adequate, and that training of affected personnel has been completed.

*Process Safety Information –* data associated withthe chemical/biological agent, the process technology and the equipment within the covered process area that is necessary for affected individuals to operate the process safely, reliably and efficiently.

*Process Safety Master File* – The location where information on a covered process regarding chemical/biological, technology and equipment is located or describes where the specific information is located.

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| Process Safety Management Program |
| **Title:** Pre-Startup Safety Review Procedure  **Document #:** PSM-SOP-UN-015 **Issued:** 12/09/2014 |
| **Responsible Dept.:** EHS **Version:** New  **Approved By:** PSM Focus Group **Page:** 1 of 6 |

**1.0 Purpose:** This document provides guidance to employees of The Pennsylvania State University (Penn State) in the requirements of conducting Pre-Startup Safety Reviews (PSSR) within the Process Safety Management (PSM) Program. The intent of this element is to define the requirements on when and how to conduct PSSR’s within the covered process areas

**2.0 Scope:** The PSSR is completed prior starting up new covered process areas and for modifications to existing covered process areas that are significant enough to require a change in the Process Safety Information (PSI). The PSSR represents field verification that the change was conducted the way it was designed and approved through the Management of Change (MOC) Element (#14).

**3.0 Responsibility:** The following employees have specific responsibilities assigned to them in accordance with the requirements of the PSSR procedure. Specific Budget Executives and Budget Administrators may assign these responsibilities to a Department or individual other than the one identified in this procedure as appropriate.

Budget Executives and Budget Administrators:

1. Assume primary responsibility to maintain a safe work environment within their jurisdiction, by monitoring and exercising control over their assigned areas.
2. Assign a representative from their respective academic or administrative unit to ensure compliance with this procedure.
3. Ensure appropriate mechanisms exist to conduct PSSR’s within the academic departments or administrative units for which they are responsible.

Director Design & Construction:

1. Ensure employees within their area(s) of responsibility understand and follow the PSSR requirements outlined in this procedure.
2. Ensure PSSR’s are completed prior to starting up a new PSM covered facility / process.
3. Provide appropriate opportunities for employees to actively participate in PSSR’s as the individuals with design experience within the specific covered process being assessed.

Manager Engineering Services:

1. Ensure employees within their area(s) of responsibility understand and adhere to the PSSR requirements.
2. Provide appropriate opportunities for employees to actively participate in PSSR’s as appropriate.

Project Managers:

1. Participate in PSSR’s and provide input into covered process area design and reassessments.
2. Address any assigned action items and/or recommendations generated from the PSSR process.

Building Operations / Utility Engineers:

1. Participate in PSSR’s and provide technical / equipment input into covered process area design and reassessments.
2. Address any assigned action items and/or recommendations generated from the PSSR process.

Physical Plant Supervisors:

1. Ensure employees within their area(s) of responsibility are aware and understand their responsibilities outlined within this procedure.
2. Provide appropriate opportunities for employees to actively participate in PSSR’s as the individuals with equipment experience within the specific covered process being reviewed.
3. Address any assigned action items and/or recommendations generated from the PSSR process.
4. Take prompt corrective action when unsafe process safety conditions or practices are observed or reported.

Operations/Facility Manager:

1. Ensure employees within their area(s) of responsibility are aware and understand their responsibilities outlined within this procedure.
2. Ensure PSSR’s are completed prior to re-starting the covered process equipment or operation.
3. Provide appropriate opportunities for employees to actively participate in PSSR’s as appropriate (e.g. Maintenance, Research and Development, etc.).
4. Take prompt corrective action when unsafe process safety conditions or practices are observed or reported.

Safety Officer:

1. Coordinate implementation of the PSSR program within the work unit.
2. Participate in PSSR’s as appropriate and provide technical input into covered process area design and reassessments.
3. Address any assigned action items and/or recommendations generated from the PSSR process.

Process Safety Program Manager – EHS Department:

1. Oversee all aspects of the University’s Process Safety PSSR program.
2. Manage identification of MOC’s requiring a PSSR, PSSR reports / documentation and track completion of Action Items generated through this element.
3. Track and report metrics established for this element to affected groups and senior leadership as appropriate.
4. Coordinate auditing of the PSSR element requirements.

Employees:

1. Participate in PSSR’s and provide technical input into covered process area design and reassessments.
2. Address any assigned action items and/or recommendations generated from the PSSR process.
3. Report Process Safety issues or concerns to appropriate line management and/or the Process Safety Program Manager.

**4.0 Definitions:**

*Block Flow Diagram –* diagram used to show the major process equipment and interconnecting process flow lines and show flow rates, stream composition, temperatures, and pressures when necessary for clarity.

*Change* – any planned temporary or permanent change to an existing procedure, process or facility (whether hardware or software) which is not considered an “In-Kind Replacement”.

*Covered Process* - any process where a highly hazardous chemical / biological agent or extremely hazardous substance deemed by Penn State is used, handled or stored. This also includes critical process operations identified by the University that would benefit from PSM program implementation.

*Operations/Facility Manager* – a person who has control / oversight of building use, stewardship, operation, repair, and general administration of campus facilities. Also includes the operational responsibility of a specific unit operation within a facility.

*Physical Plant Supervisors* – group of individuals in first-line management who monitors and regulates employees in their performance of assigned or delegated tasks (e.g. trains, evaluates, hires, and discipline employees; approves time & attendance; administers the University / Teamster contract, manages absences; plans & rotates overtime work, etc.).

*Piping & Instrumentation Diagram (P&ID) -* is to be generated for each stage of a covered process. It should reflect the as-built equipment setup, instrumentation & controls, safety systems and interlocks included in a covered process. A P&ID is the one document that when properly completed shows the most information pertaining to the technology of the covered process. It is generally considered to be the single most vital document that must be used when performing a Process Hazard Analysis (PHA).

*Pre-Startup Safety Review (PSSR)* – a technical review and inspection of equipment modification prior to startup to ensure that the modification has been installed in accordance with the approved design standards, that procedures are in place and adequate, and that training of affected personnel has been completed.

*Process Hazard Analysis (PHA) -* is an analytical tool that is used to identify the inherent causes and subsequent consequences of potential accidents or hazard scenarios that involve fires; explosions; releases of toxic, reactive or flammable chemicals/biological agents; and major spills of hazardous chemicals/biological agents and to recommend corrective measures to prevent such occurrences.

*Process Safety Information –* data associated withthe chemical/biological agent, the process technology and the equipment within the covered process area that is necessary for affected individuals to operate the process safely, reliably and efficiently.

*Process Safety Master File* – the location where information on a covered process regarding chemical / biological, technology and equipment is located or describes where the specific information is located.

**5.0 Procedure:** Conducting the PSSR before starting or restarting the operation is important to ensure the as-built condition is the same as the approved design. In addition, it serves to verify that all associated process equipment is functional and operating properly, affected employees have been properly and thoroughly trained and that all process documentation and procedures are up-to-date prior to start-up of a process. For this to be successful, it must be conducted after the modifications have been completed but before the operation is started or re-started.

For new facilities covered by the PSM Program, a PSSR shall be performed and recommendations resolved or implemented before startup. For existing operations where a PSSR is required through the MOC process, it shall be performed and appropriate recommendations resolved before restarting the affected process.

The following steps outline the requirements relating to identifying when the PSSR is required, conducting the PSSR and documentation required within this element:

1. Once a new facility / process has been approved to proceed and has been identified as covered within the PSM Program, the Director of the Design and Construction group will ensure the Process Safety Program Manager (PSPM) is notified of the associated design and construction schedule for the project. After the PHA Review report has been issued, appropriate action items have been addressed and prior to start-up, the PSPM will schedule the PSSR.
2. For existing PSM covered process areas, a PSSR shall be conducted if one of the following conditions are met:
   1. Restart of an existing covered process after a prolonged outage or as designated by senior leadership
   2. After a significant modification that impacts the process safety information of a covered process
3. A change impacting the process safety information is required to go through the Management of Change (MOC – Element # 14) review. The MOC originator will identify if a PSSR is required utilizing the Management of Change Form (PSM-SOP-UN-003ata) and is responsible to schedule the PSSR with the appropriate individuals. In addition, the PSPM will verify through the MOC approval process that a PSSR has been correctly identified and scheduled.

Scheduling and completing the PSSR must consider the work associated with the change and any operational requirements since the PSSR may generate additional action items required before starting / restarting the affected equipment.

1. The PSSR is to be completed through a team approach with individuals selected based on their knowledge, experience and responsibilities associated with the covered process area. At least one of the individuals conducting the review must be knowledgeable in the operation of the process. Participants in the PSSR are responsible to assess if the covered process can be started or re-started safely.

Although the PSSR Team composition can vary, the typical participants should include representatives from the following groups:

* 1. Design & Construction
  2. Engineering Services
  3. Operations / Facility Manager
  4. Safety Officer
  5. Supervisor, Area Services
  6. Equipment Operators
  7. Environmental Health & Safety

For a new facility / process, the above list will be the minimum required PPSR Team. For existing covered processes, the size of the team will be based on the complexity of the MOC but should typically consist of the MOC Originator, Engineering Services, Equipment Operators and PSPM. The minimum PSSR Team shall consist of the MOC Originator, Equipment Operators and PSPM.

Depending on the scope of the PSSR, 3rd party participants can be included on the review team. These could include contractors that have appropriate information or technical expertise associated with the equipment or process being reviewed.

1. Each PSSR will have a Team Leader that is responsible for scheduling, selection of team members and documenting the review. For a new facility / process the Project Manager will be the PSSR Team Leader unless an alternate is identified. For existing covered processes, the MOC Originator will be the PSSR Team Leader unless an alternate is identified.

The PSSR Team Leader is responsible to select the appropriate team members and schedule the necessary review meeting(s). In addition, the PSSR Team Leader is responsible to document the review and capture any action items or questions identified during the PSSR.

To assist the PSSR Team in conducting their assessment, a standard review checklist has been developed – Pre-Startup Safety Review Checklist (see Attachment A) as a guide. This document will also serve as documentation that equipment is functional and operating properly, affected employees have been trained and that process documentation and procedures are available prior to start-up or restarting the process.

1. The PSSR team members must come prepared to the review meeting(s) with a basic understanding of the general process and equipment involved within the assessment. If they require any additional information (MOC, Block Flow Diagram, P&ID, etc.), it should be communicated to the PSSR Team Leader prior to the initial review meeting.

It is the responsibility of the PSSR team to complete the final review to confirm that:

6.1 Facility construction and process equipment have been installed in accordance with design specifications

6.2 Operating, Maintenance, EHS and Emergency procedures are in place and are adequate

6.3 Each employee involved with the operation of the covered process is adequately trained

6.4 All required process safety documentation is up-to-date and on file

Each PSSR will be assigned a unique identifier that enables appropriate tracking and closure. The PSPM will provide the appropriate PSSR No. to the Team Leader no later than the initial review meeting. This unique number will be noted on the PSSR Checklist.

1. Any deficiencies identified through the PSSR should be remedied prior to the startup of the process. Issues associated with the safe operation of the process (e.g. safety interlock, equipment/personnel safe guard, etc.) must be corrected prior to startup. Documentation associated with the PSSR and any deficiencies including the implemented corrective action will be maintained in the Process Safety Master File.

Corrective actions generated through the PSSR will be managed in accordance with the requirements outlined in the Management System to Address Action Items procedure (PSM-SOP-UN-014).

1. The PSPM will track completion of all assigned actions associated with a PSSR and upon completion, close the PSSR. Closure of a PSSR will be communicated to the PSSR Team members.
2. The PSPM is responsible to maintain the PSSR documentation as part of the Process Safety Master File and with the MOC review documents for existing covered processes as appropriate.
3. The PSPM will periodically audit compliance to the requirements within this element including availability of appropriate information and/or training required prior startup / restarting the covered process on select PSSR’s.

**6.0 Attachments**

* 1. Attachment A – Pre-Startup Safety Review Checklist