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| Process Safety Management Program |
| **Title:** Compliance Guidelines for Process Hazard Analysis Review  **Document #:** PSM-SY-UN-013 **Issued:** 09/03/2014 |
| **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 Process Hazard Analysis Review Element of the Process Safety Management (PSM) Program.

**2.0 Scope:** The intent of this element is to define the requirements to revalidate a Process Hazard Analysis (PHA) every five (5) years. Certain changes to a covered process may require a new PHA or a re-evaluation of part of a previous PHA, but those are triggered and managed through the Management of Change (MOC’s) Element (#14). The revalidation process will follow the PHA Element (#03) requirements and consider current operating procedures, MOC’s, Incident Reports, and effectiveness of process safe guards.

**3.0 Guidelines:** Penn State will revalidate a PHA at least once every five (5) years by a qualified PHA Team to assure that the PHA is consistent with the current operation of the process. The PHA Review enables a revalidation of potential hazards associated with the covered process area, verify existing safe guards are adequate and assess potential changes around the process that modifies the risk assessment determination. In addition, the PHA Review provides a mechanism to assess the overall impact of minor changes that occur between PHA’s.

As part of the PHA Review, the following areas will be considered during the re-evaluation:

1. The previous PHA Report
2. Findings and Recommendations from the previous PHA Report
3. Documentation associated with the Management of Change (MOC) for the specific covered process area
4. Incident Reports for the specific covered process area
5. Summary of the process technology including chemical/biological agents used, block flow diagrams, and P&ID’s
6. Operating Procedures

The PHA Review Team will consist of a Team Leader that is responsible for selecting the remaining members of the PHA Team. The makeup of the PHA Team shall include:

1. At least one person who has experience and knowledge in the specific PHA methodology planned to be used;
2. At least one person who has experience and knowledge in the operation of the specific process being reviewed
3. At least one person who is familiar with the equipment that is used in the process
4. Other members could include individuals with expertize and/or knowledge in the following disciplines:
   1. Engineering principles
   2. Instrumentation
   3. Equipment design/set-up
   4. Research and Development
   5. Maintenance
   6. Environmental, Health & Safety

Note: it is not necessary to have a different person for each of the areas of expertise referenced above. One person may satisfy two or more of the areas as appropriate.

The methodology used to conduct the PHA Review can be the same or different than utilized during the previous PHA. Depending on the complexity of the process, conducting the PHA Review using a different method may lead the team to identify additional hazards. The PHA Review Team Leader will determine the appropriate methodology to utilize for the PHA Review.

The Findings and/or Recommendations from a PHA Review will be managed according to the Management System to Address Action Items Element (#04).

PHA Review can be conducted more frequently than once every five (5) years, on an existing covered process, if a change is significant enough to warrant such a study or if senior leadership deems appropriate due to a high degree of risk associated with the specific covered process area, high rate of process safety related incidents or numerous process changes have occurred since the last PHA.

The Process Safety Program Manager (PSPM) is responsible to maintain a PHA Review Master Schedule for the University. The Master Schedule will outline the date of the original PHA and subsequent PHA’s completed as part of an MOC or PHA Review for each covered process.

**4.0 Definitions:** The following definitions provide guidance regarding common issues surrounding the Process Hazard Analysis Review Element.

*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.

*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).

*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 Hazard Analysis Review Team Leader* – an individual formally trained in leading PHA’s and responsible for preparing the necessary documentation for the review and written report. In addition, in conjunction with the responsible senior leadership will select the PHA Review Team members.

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| Process Safety Management Program |
| **Title:** Process Hazard Analysis Review Procedure  **Document #:** PSM-SOP-UN-013 **Issued:** 11/26/2014 |
| **Responsible Dept.:** EHS **Version:** New  **Approved By:** PSM Focus Group **Page:** 1 of 5 |

**1.0 Purpose:** This document is intended to guide employees of The Pennsylvania State University (Penn State) in the requirements of conducting Process Hazard Analysis Reviews within the Process Safety Management (PSM) Program. This procedure supplements the Process Hazard Analysis requirements outlined in PSM-SOP-UN-012.

**2.0 Scope:** All Process Hazard Analyses (PHA) conducted on a defined covered process area are required to be revalidated every five (5) years. The revalidation process will follow the PHA Element (#03) requirements and must consider current operating procedures, MOC’s, Incident Reports, and effectiveness of process safeguards.

**3.0 Responsibility:** The following employees have specific responsibilities assigned to them in accordance with the requirements of Process Hazard Analysis Review within the PSM Program. 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 units to ensure compliance with this procedure.
3. Ensure appropriate mechanisms exist to conduct PHA Reviews within the academic departments or administrative units for which they are responsible.

Manager Engineering Services:

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

Building Operations / Utility Engineers:

1. Participate in PHA Reviews and provide technical input into covered process area design and reassessments.
2. Address any assigned action items and/or recommendations generated from the PHA Review process.

Physical Plant Supervisors:

1. Ensure employees within their area(s) of responsibility are aware and understand their responsibilities outlined within the PHA Review procedure.
2. Provide appropriate opportunities for employees to actively participate in PHA Reviews 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 PHA Review 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 the PHA Review procedures.
2. Provide opportunities for employees to actively participate in PHA Reviews as appropriate (e.g. Maintenance, Research and Development, etc.).
3. Take prompt corrective action when unsafe process safety conditions or practices are observed or reported.

Safety Officer:

1. Coordinate implementation of the PHA Review program within the work unit.
2. Participate in PHA Reviews 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 PHA Review process.

Process Safety Program Manager – EHS Department:

1. Oversee all aspects of the University’s Process Safety PHA Review program.
2. Manage PHA Review Reports, PHA Review Master Schedule and track completion of Action Items.
3. Track and report metrics established for this element to affected groups and senior leadership as appropriate.
4. Coordinate auditing of PHA Review element requirements.

Employees:

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

**4.0 Definitions:**

*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.

*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.

*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).

*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 Hazard Analysis Review Team Leader* – an individual formally trained in leading PHA’s and responsible for preparing the necessary documentation for the review and written report. In addition, in conjunction with the responsible senior leadership will select the PHA Review Team members.

**5.0 Procedure:** Penn State has established a requirement to revalidate a PHA at least once every five (5) years by a qualified PHA Review Team. The PHA Review enables a revalidation of potential hazards associated with the covered process area, verify existing safe guards are adequate and assess potential changes around the process that modifies the risk assessment determination. In addition, the PHA Review provides a mechanism to assess the overall impact of minor changes that occur between PHA’s.

The PHA Review has been established as a separate Element within the University’s PSM Program since certain covered processes may be identified after initial start-up. The following steps outline the requirements relating to conducting and tracking PHA Reviews:

1. The PHA Review will be conducted by a Team that has the necessary technical knowledge and/or experience to thoroughly assess the inherent causes and subsequent consequences of potential accidents or hazard scenarios that involve fires, explosions, releases of toxic materials, reactive or flammable chemicals/biological agents and major spills of hazardous chemicals/biological agents. The Team should also be able to recommend corrective measures to prevent such occurrences.
2. A PHA Review Team Leader will be assigned by the Process Safety Program Manager (PSPM) who is responsible for selecting the remaining members of the review team. The Team Leader must be someone who is trained or has significant experience in the methodology used to conduct the PHA Review. In addition, the PHA Review Team Leader is responsible to collect or assign members on the review team to acquire the necessary documentation required to complete the PHA Review.
3. The PHA Review Team Leader will select the review members and shall include:
   1. At least one person who has experience and knowledge in the specific PHA methodology planned to be used;
   2. At least one person who has experience and knowledge in the operation of the specific process being reviewed
   3. At least one person who is familiar with the equipment that is used in the process
   4. Other members could include individuals with expertize and/or knowledge in the following disciplines:
   5. Engineering principles
   6. Instrumentation
   7. Equipment design/set-up
   8. Research and Development
   9. Maintenance
   10. Environmental, Health & Safety

Note: it is not necessary to have a different person for each of the areas of expertise referenced above. One person may satisfy two or more of the areas as appropriate.

1. To effectively re-evaluate the original PHA or the previous PHA Review to assure that it remains consistent with the current covered process operations, the following information must be considered by the review team:
   1. The previous PHA Report
   2. Findings and Recommendations from the previous PHA Report
   3. Management of Change (MOC) documentation associated with the specific covered process area
   4. Incident Reports and results of investigations for the specific covered process area.
   5. Summary of the process technology including chemical/biological agents used, block flow diagrams and P&ID’s
   6. Operating Procedures
2. The PSPM will assign the PHA Review Team Leader at least six (6) months prior to the revalidation date to afford appropriate scheduling time to prepare and conduct the review. If the PHA Review Team Leader is unable to conduct the review within the required timeframe, the PSMP will be notified at least three (3) months prior to the revalidation date.
3. The PHA Review Team Leader will ensure the appropriate information is collected and as appropriate distributed to the review team to afford sufficient time for review. This information should be distributed at least two (2) weeks before the scheduled review meeting.
4. Review team members must come prepared to the PHA Review meeting(s) with an understanding of the general process and the information distributed by the Team Leader prior to the review meeting.
5. The PHA Review Team Leader is responsible to document the PHA Review utilizing the PHA Worksheet and associated assignment of Action Items generated through the review process. A PHA Review Report will be prepared by the Team Leader and forwarded to the PSPM within 21 days after the final review meeting. The information collected as part of the PHA Review, including the Final Report will be maintained by the PSPM within the Process Safety Master File for the specific unit operation.
6. A PHA Review can be conducted more frequently than once every five (5) years, on an existing covered process, if a change is significant enough to warrant such a study or if senior leadership deems appropriate due to a high degree of risk associated with the specific covered process area, high rate of process safety related incidents or numerous process changes have occurred since the last PHA. The PHA Review Master Schedule will be updated to reflect the revision accordingly.
7. The PSPM is responsible to maintain the PHA Review Master Schedule for the University. The Master Schedule will outline the date of the original PHA and subsequent PHA’s completed as part of an MOC or PHA Review for each covered process. In addition, the PSPM will periodically audit facility compliance to the requirements within this element including status and effectiveness of Action Items identified by the PHA Review Team.

**6.0 Attachments**

* 1. Attachment A - PHA Worksheet