Effective PSSR in Management of Change for Existing Plants

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Pre Startup Safety Review

Last chance to confirm the objectives of change have been met and potential risks are mitigated before energize the system.
Case Study: Sweetening Unit Start-up

• Gasket rupture of an Exchanger during start-up.

• Causes:
  o Material defect
  o Construction/installation error (misaligned flanges)

• Findings:
  o PHA did not include this scenario for start-up
  o Gasket and flanges were not tested before installation
When we need PSSR?

**CFR 1910.119(i)**
The employer shall perform a 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.

**Canadian PSM Guideline:**
Element 3 (Capital Project Review and Design Procedure)
Element 6 (Process and Equipment Integrity)
Pre-startup safety reviews should be conducted before commissioning a new or modified process, replacing equipment or recommissioning mothballed equipment. The review should cover both equipment and operating procedures to ensure that all elements are in place and functional.
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PSSR Requirement

Check:
- PSIs (e.g. P&IDs) are updated
- Design intent is met
- Update of Procedures and instructions
- Completion of training program
- Review completion of incident investigation recommendations,
- Review compliance audits,
- Review PHA recommendations

Further Items:
- Human Factors
- SCE List
- SCE Performance Standards
- PHA Recommendations are implemented
PSSR Team

- A multidisciplinary team is selected for PSSR.
- PSSR Lead should be Competent:
  - Good understanding of relevant PSIs
  - Good knowledge about what regulation requirement
  - Preferably, good knowledge on the subject of the change
- Independent from the change request or process
PSSR: Have We Checked Human Factors Requirement?

Sprinkler:
- No mechanical handling is required.
- Only access to the valve is needed

Gaseous System:
- Mechanical handling is required.
- Access for Replacement of cylinders
MoC Risk Assessment

- Currently, What-if is a common used risk assessment method for management of change process in existing facilities.

- Concern:
  - What-if is not always the proper method to use
  - Competent facilitator is not chairing the meeting
  - Sometimes residual risks are not estimated
PSSR : Risk Assessment Close-out

• 35 recommendations made by the National Transportation Safety Board

• Only six have been successfully completed

• Fourteen of the recommendations issued to the Federal Aviation Administration and its European counterpart, EASA, are marked by the NTSB as “closed-unacceptable.”

• Recommendations that got an “unacceptable” response deal with:
  o Pilot training,
  o Directions for pilots facing the loss of power in both engines,
  o Equipping planes with life rafts and vests and making it easier for passengers to use them

US Airways Flight 1549 Incident
Risk Assessment Close-out

- PSM Guideline Element 3: “Confirm that a process hazard analysis has been done and that recommendations have been resolved or implemented prior to start up”

- If a recommendation is unacceptable then ALARP demonstration and senior management approval is needed.
“The big accidents are just waiting for the little ones to get out of the way.”

Carolyn Merritt (Former CSB Chair)
Update Process Safety Information

- Some of the key documents (such as P&IDs) shall be authenticated and stamped by a professional engineer.
- Ensure the updated PSI have been reviewed by all stakeholders.
- Ensure all PSIs are communicated and approved by the applicable regulators.
PSSR Documentation

• Proper documentation is needed for future Investigation
Summary

• Review of Human Factors requirements to ensure the mechanical change does not create an ergonomic hazard.

• Ensure a proper risk assessment method is selected and all the residual risks are reduced to an acceptable level.

• Closing out the recommendations of risk assessment study is not completed until their implementation is verified. If the recommendation is not feasible then ALARP demonstration and senior management approval is needed.

• Procedures should be updated and approved.

• Change in a SCE should be highlighted in PSSR to ensure that the relevant documents (performance standards, verification scheme, etc) have been updated.
Thank you

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