Best Practices for Management of Change and Maturity Level Measurements

PSRG Process Safety and Reliability Group www.psrg.com

P2SAC Purdue Process Safety & Assurance Center

Tutorial Session – Management of Change and Maturity Levels

Presenter

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Agenda

- Defining Management of Change (MOC)
- Best Practices observed in implementing a successful MOC program
- Maturity Model to assess how well the MOC process is established, managed, and continuously improved
- Seven Best Practices for optimizing a MOC Program
- Gamification use and implementation in MOC training
- Gamification examples

Acronyms

- MOC – management of change
- PSM – process safety management
- KPI – key progress indicator
- P&ID – piping and instrumentation diagram
- PSI – process safety information
- OSHA – Occupational Safety and Health Administration

U.S. OSHA ENFORCEMENT CITATIONS

Mechanical Integrity	358
Process Safety Information	329
Operating Procedures	298
Process Hazards Analysis	294
Management of Change	136
Incident Investigation	90
Compliance Audits	82
Training	50
Contractors	47
Employee Participation	31
Emergency Planning & Response	24
Pre-Startup Safety Review	18
Hot Work Permits	9

1415
80%

Source: U.S. OSHA NEP for Refineries and Chemical Plants

What is Management of Change?

- Refers to a systematic process that organizations implement to assess and control changes in their facilities, processes, or operating procedures that could potentially impact safety.
- The primary goal of MOC is to prevent accidents, incidents, or other adverse consequences resulting from changes in the workplace.
- Mandated by OSHA Process Safety Management of Hazardous Chemicals (29 CFR 1910.119) and EPA Risk Management Program rule (40 CFR Part 68).

When to Initiate Management of Change?

- When there is a change:
  - Change: Any addition, process modification, or substitute item (e.g. person or thing) that is not a replacement-in-kind (RIK) such as process chemicals, processing conditions, equipment, procedures
  - Replacement-in-kind (RIK): An item (equipment, chemicals, procedures, organizational structures, people, etc.) that has the exact design specifications, if one exists, for the item it is replacing.

Some Examples

- Management of Change
  - Removal of equipment (demolition) in a process
  - Replacing outdated equipment with newer equipment with different specs

- RIK
  - Replacing a relief valve with the same type, set pressure, rating
  - Replacing vessels and piping with the same dimensions, configuration, and specifications

Different Types of MOC

- Permanent MOC: fixed changes
- Temporary MOC: A change that is intended to exist for a short, predetermined, finite period (typically 90 days)
- Emergency MOC: A change initiated and implemented quickly for safety, environmental, production equipment impairment, or potential equipment damage

Best Practices Observed in Implementing a Successful MOC Program

- Assign an MOC coordinator.
- Have a dedicated document controller.
- Indicate if the MOC is PSM related.
- Track relevant KPIs for MOCs.
- Review MOC program yearly.

Best Practices Observed in Implementing a Successful MOC Program

- Assign an MOC Coordinator:
  - MOC Coordinator acts as the custodian of the MOC procedure as well as the administrator of the relevant MOC software.
  - MOC Coordinator does not need to be an expert in PSM but should be able to interact with all job functions effectively with great communication skills.
- Have a person dedicated to document control/tracking:
  - Document Control/Tracking person could be the same person as the MOC Coordinator. This person is the main custodian of all paper/digital copies of the MOC including redlined P&IDs, hazard assessments, etc.

Best Practices Observed in Implementing a Successful MOC Program

- Add a checkbox for an MOC indicating if it is PSM related:
  - There may be many MOCs not related to PSM.
  - It is critical for each MOC to indicate if it is a change covered by PSM.
  - A good governance program should exist who decides the PSM designation for an MOC, and who checks/confirms that designation.
  - This practice also forces the organization to better define the boundaries of the PSM covered processes.

Best Practices Observed in Implementing a Successful MOC Program

- Track relevant KPIs for MOCs:
  - Need to select KPIs judiciously. Track KPIs that improve the MOC program. Consider your goals and objectives, then set up KPIs.
- Review MOC program on a yearly basis:
  - Finally review the health of the MOC program.
  - Health check should also gauge if there is a full employee buy-in for the program.

How to Gauge a Site's MOC Maturity?

- Purpose: Assess how well the MOC Process is Established, Managed, and Continuously Improved
- Identify the elements of an effective MOC program.
  - Use policies/procedures, change management tools and systems, personnel competencies, risk assessment and hazard analysis, and stakeholder involvement.
- Develop a maturity model that defines the stages of MOC program maturity, from initial development to continuous improvement.
  - Include criteria that are specific to the organization and industry.

How to Gauge a Site's MOC Maturity?

- Conduct an assessment against the maturity model criteria.
- Evaluate the results.
- Develop an improvement plan to address areas of weakness.
- Monitor and continuously improve.

PSRG Maturity Model ™ - MOC Decision Table

MANAGEMENT OF CHANGE			
Level 1 - Reactive	**Level 2 - Dependent**	**Level 3 - Managed**	**Level 4 - Optimized**
• Form developed. • MOCs open more than 180 days after installation. • Temporary MOCs overdue or are completely missing.	• MOC procedure and form includes temporary and emergency changes. • MOCs open more than 90 days after installation but <180. • All employees trained. Training doc. available. Refresher training conducted annually. • Retrievable.	• Process covers instructions for emergency changes / approval process. • Flow diagram developed. • PSI checklist included • Auditing process developed. • MOCs closed within 30 days of installation.	• Employees verify in writing, prior to operating the changed equipment, that the change is understood. • Actions completed upon installation • Auditing process. developed, evaluation data collected and trended for continual improvement.

Optimizing the MOC Program

Seven (7) best practices for optimizing maturity planning through MOC to ensure changes are implemented safely, efficiently, and effectively:

1. Establish a robust MOC process.
2. Prioritize changes based on risk.
3. Involve key stakeholders.
4. Conduct a thorough impact assessment.
5. Develop a comprehensive implementation plan.
6. Train Personnel.
7. Monitor and Evaluate.

Optimizing the MOC Program

1. Establish a robust MOC process: Develop a clear and comprehensive MOC process that includes roles and responsibilities, documentation requirements, review and approval procedures, and verification and validation steps.
2. Prioritize changes based on risk: Evaluate each proposed change based on its potential impact on safety, health, environment, production, and compliance, and prioritize changes accordingly. High-risk changes should receive greater scrutiny and more thorough analysis.
3. Involve key stakeholders: Ensure that all relevant stakeholders are involved in the MOC process, including operators, maintenance personnel, engineering, safety, and management. This will help to identify potential issues early on and ensure that all parties are aware of the changes and their implications.

Optimizing the MOC Program

4. Conduct a thorough impact assessment: Conduct a detailed impact assessment to identify potential hazards, risks, and unintended consequences associated with the proposed change. This should include an evaluation of the potential impact on equipment, procedures, personnel, and the environment.

5. Develop a comprehensive implementation plan: Develop a detailed implementation plan that outlines the necessary steps and resources needed to implement the change. This should include a timeline, budget, resource allocation, and contingency plan.

6. Train personnel: Ensure that all personnel involved in the MOC process are adequately trained and understand their roles and responsibilities. This includes training on the MOC process itself, as well as any specific training needed to implement the change.

7. Monitor and evaluate: Monitor the implementation of the change to ensure that it is implemented correctly and that there are no unintended consequences. Evaluate the effectiveness of the change over time to identify any areas for improvement and to ensure that the desired outcomes are achieved.

Gamification

- Gamification is a set of learning management tools aimed at increasing employee knowledge and improving performance.
  - It involves adding game mechanics into nongame environments.
- Gamification is intended to inspire users to engage with the content, especially with tasks that are not enjoyable, as for example, in-depth safety training or compliance training.
- Gamification activities can be performed for different work groups: operators, technicians and engineers/administrative personnel.

Gamification Purpose

- Helps companies identify their future leaders and provide tools for motivated workers to contribute and be recognized.
- Provide employees with the chance to learn about leadership roles, develop management skills, and become better known within their organizations based upon their gameplay.
- Motivate the disengaged.

Examples of Types of Games for MOC Process Improvement and Achievement

- Traditional Educational Jigsaw Puzzles
  - MOC Process Flow Diagram, BFDs, PFDs
  - Individual training or team building exercises
- Crossword Puzzles
- Word Search

Jigsaw Puzzles

- Challenge the team's observation skills, creativity, and concentration.
- Timers can be used to see which individual or team can complete their puzzle before the deadline.
- Team building puzzles require communication between team members to help the team understand the puzzle, present ideas, and work together to solve the puzzle within a time limit.
- Employees who communicate well are effective team members and can be more productive and trustworthy.
- Pros: Puzzles develop memory skills, as well as an ability to plan, test ideas and solve problems.

Crossword Puzzles

- Pros: Teaches new vocabulary.
- Inspires thinking and provides an opportunity to evaluate knowledge.
- Two Ways to Present for Training:

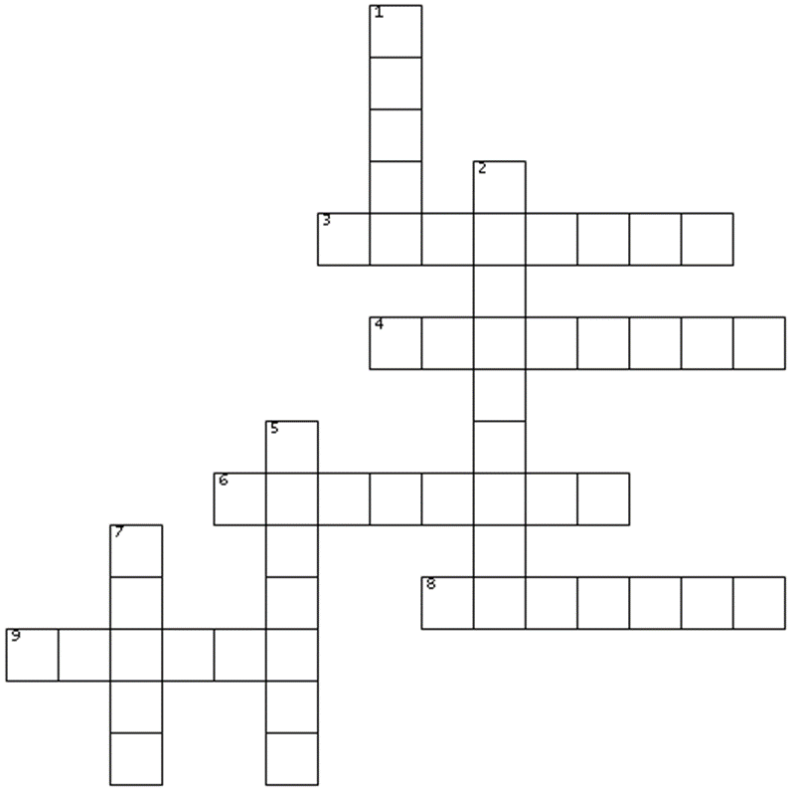
  List Clues → Solve Puzzle

  Provide Solved Puzzle → Develop the Clues

Word Search Puzzles

- Pros: improves concentration and boosts problem-solving skills, enhancing vocabulary.
- The game consists of letters of words placed in a grid which usually has a rectangular or square shape.
- Goal is to find the words placed in the puzzle grid. Words can be in any direction. Words can share letters as they cross over each other.
- Important keywords from the MOC Procedure can be used.
- Can be printed or turned into a dynamic word search puzzle completed on-line.

Crossword Example



ACROSS

3. The action of officially agreeing to a proposed change
4. The buildings, containers or equipment which contain a process
6. Example of a process limit variable
8. To delete, add or edit something in a document using a specific color
9. Make something different, alter, or modify

DOWN

1. A methodology to evaluate the hazards of a process
2. A set of written instructions that describes the step-by-step process to properly perform a routine
5. Any activity involving a HHC including use, storage, manufacturing, handling or on-site movement
7. Teach through practice or instruction

Conclusion

- Presented best practices for implementing a MOC program and for optimizing maturity planning through MOC to ensure that changes are implemented safely, efficiently, and effectively.
- The MOC Maturity Model provides a framework for evaluating the maturity of an organization's MOC system and identifies areas for improvement.
- Gamification is a set of learning management tools aimed at increasing employee knowledge and improving performance in MOC and other PSM elements. It involves adding game mechanics into nongame environments.

Thank you for your attention!!
ANY QUESTIONS?

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