



Hazard Analysis for MOC's

EHSS-Management of Change Program – Appendix C

The following provides information for the non-PSM area Hazard Analysis evaluation of risk related to the **Management of Change** program.

1. Hazard Analysis Method

- a. There are many methods for conducting a hazard analysis that can be utilized if the facilitator conducting the analysis is familiar with the process.
- b. The method chosen should consider the complexity and type of change that is being reviewed.

Note: For most changes, the What-If analysis method is appropriate with targeted questions relevant to the change being considered.

- c. Reference list for different methods:
 - i. What-If analysis
 - ii. Checklist analysis
 - iii. What-if / checklist analysis
 - iv. Hazard and Operability analysis (HAZOP)
 - v. Failure mode and effects analysis (FMEA)
 - vi. Fault tree analysis
 - vii. Or other methods

2. Risk Matrix

- a. The method chosen for the hazard analysis will determine which risk matrix will be utilized for risk ranking potential scenarios or areas of concern.
 - i. Mosaic Risk Assessment Matrix (RAM) considers safety, environmental, business, and image impacts.

Note: For most changes, the RAM is appropriate for risk ranking.
 - ii. PHA Risk Matrix (PHARM) considers safety and environmental impacts and is targeted toward recommending more controls or safeguards for high consequence scenarios. This matrix is typically used for 5-year cyclical PHAs and will be required for PSM MOCs.

Note: For changes requiring the HAZOP methodology, the PHARM is generally most appropriate.

3. Team Makeup

- a. Team members will include a facilitator and appropriate subject matter experts (SMEs).
 - i. Facilitator can be the Change Coordinator, a process engineer, a production engineer, a reliability engineer, a process safety engineer, or someone else trained in the selected methodology.



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Note: It is not required that the facilitator knows the production process for which the proposed change is occurring, however this knowledge is generally helpful while conducting the hazard analysis.

- ii. Team members can include many different SMEs such as operations, maintenance, engineering, EIA, and EHS personnel.

Note: An SME representative for each type of required MOC review is to be included in the hazard analysis (reference the SME Review Requirement Questionnaire to determine which review types are required).

- b. The team should consist of as few members as necessary to thoroughly review the proposed change but should involve at least 2 personnel.

4. Documentation for the Hazard Analysis should include:

- a. Team members
- b. Date
- c. MOC # and description
- d. Hazard analysis worksheet to convey the questions, scenarios, and logic of the hazard analysis team.
- e. Recommendations
- f. The final copy of the hazard analysis will be documented within the MOC folder.

5. Tracking Recommendations

- a. Recommendations from the hazard analysis are to be entered into the MOC for the project as pre-start or post-start action items.
- b. Rejection of a hazard analysis recommendation must be approved by the MOC approver(s) and documented within the MOC folder.