

Unit 5

HAZARD IDENTIFICATION TECHNIQUES

Chapter 5.1

Job Safety Analysis-Preliminary Hazard Analysis-Failure mode and Effects Analysis-Hazard and Operability-Job Safety Analysis (JSA):

1. Definition:

- Job Safety Analysis (JSA) is a systematic process used to identify, assess, and control potential hazards associated with specific job tasks or activities.

2. Steps in JSA:

- Break down a job into individual tasks.
- Identify potential hazards for each task.
- Assess the level of risk for each hazard.
- Develop and implement control measures to mitigate risks.
- Communicate findings and safety measures to workers.

3. Benefits of JSA:

- Increased awareness of job-related hazards.
- Improved communication and collaboration among workers.
- Enhanced safety culture and reduced incidents.

Preliminary Hazard Analysis (PHA):

1. Definition:

- Preliminary Hazard Analysis (PHA) is a systematic process used during the early design or planning phase to identify potential hazards and assess their significance.

2. Application:

- PHA is commonly applied in industries such as engineering, construction, and product development.
- It helps in designing safety features and making informed decisions about risk mitigation.

3. Steps in PHA:

- Identify potential hazards associated with the project or design.

- Evaluate the severity, probability, and detectability of each hazard.
- Develop strategies to eliminate or control identified hazards.
- Document findings and recommendations.

4. Benefits of PHA:

- Early identification of potential hazards.
- Improved decision-making in the planning and design phases.
- Reduced likelihood of costly modifications later in the project.

Failure Mode and Effects Analysis (FMEA):

1. Definition:

- Failure Mode and Effects Analysis (FMEA) is a structured approach used to identify and prioritize potential failure modes in a system, process, or product.

2. Application:

- FMEA is widely used in industries such as manufacturing, healthcare, and automotive to assess and improve processes.

3. Steps in FMEA:

- Identify potential failure modes within a system.
- Assess the severity, occurrence, and detection of each failure mode.
- Calculate a Risk Priority Number (RPN) to prioritize risks.
- Develop strategies to mitigate high-priority risks.
- Implement and monitor improvements.

4. Benefits of FMEA:

- Systematic identification of potential failures.
- Prioritization of risks based on severity and occurrence.
- Proactive approach to risk mitigation and process improvement.

Hazard and Operability Study (HAZOP):

1. Definition:

- Hazard and Operability Study (HAZOP) is a structured and systematic examination of a complex process or system to identify potential hazards and operability issues.

2. Application:

- Commonly used in industries such as chemical processing, petrochemicals, and oil and gas.

3. Steps in HAZOP:

- Assemble a multidisciplinary team to analyze the process or system.
- Systematically examine process nodes and identify deviations from design intent.
- Assess the consequences and causes of deviations.
- Develop recommendations to mitigate identified hazards and improve operability.

4. Benefits of HAZOP:

- Comprehensive identification of hazards and operability issues.
- In-depth analysis of process nodes to uncover potential deviations.
- Enhanced safety and operability of the system.