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**15/ENG01/006**

**CHE 512**

**LOSS PREVENTION AND INDUSTRIAL LAW**

1. **Briefly discuss hazard operability technique.**

A Hazard and Operability (HAZOP) study is a structured and systematic examination of a planned or existing process or operation in order to identify and evaluate problems that may represent risks to personnel or equipment,or prevent efficient operation.

Despite its origins in the chemical and petrochemical sector, the HAZOP process works very well for all systems and processes, both technical and non-technical. It is now applied in diverse range of applications such as software development, procedure writing, contract development and organisational change.

The HAZOP process examines each of the critical properties of a system in turn. It stresses each one by discussing what could cause that property to move outside the envelope that is regarded as safe. This facilitates the specification and design of controls that ensure the system never becomes ‘unsafe’. Unsafe in this context means unacceptable in terms of performance when compared with the organisation’s objectives.

A HAZOP is a qualitative technique based on guide-words and is carried out by a multi-disciplinary team (HAZOP team) during a set of meetings.

As a risk assessment tool, HAZOP is often described as:

1. A brainstorming technique.
2. A qualitative risk assessment tool.
3. An inductive risk assessment tool, meaning that it is a “bottom-up” risk identification approach, where success relies on the ability of subject matter experts (SMEs) to predict deviations based on past experiences and general subject matter expertise.

Because HAZOP is a mental exercise, it can be implemented as part of the planning of a new work process, even before a facility is built. Existing facilities and processes can also be assessed with HAZOP.

Where a HAZOP study is performed in the planning stage of a new process, completing the study means that all potential causes of failure will be identified. The HAZOP team will write an assessment weighing the potential deviations, their consequences, their causes, and the protection requirements. From this point, changes to the plan can be made to prevent problems from arising, or to mitigate their effects.

In existing facilities, a HAZOP may be ongoing, working to improve the process without any specific end date. Instead of a single, large assessment, the study’s results will be released as a stream of action items, as each problem is identified and a solution is created.

In both cases, when a hazardous condition is identified, recommendations may be made for process or system modifications, or further study by a specialist may be required. A HAZOP study might recommend these typical actions:

1. A review of existing protection system designs by a specialist
2. Adding or modifying alarms that warn of deviations
3. Adding or modifying relief systems
4. Adding or modifying ventilation systems
5. Increasing sampling and testing frequency
6. **State the significance of the HAZOP technique**

In addition to helping the plant run smoothly, Hazard and Operability studies also allow safety professionals to identify and then either control or elminate hazards.

HAZOP is ideal for large and complex systems. Breaking these down into their component parts and assessing each in turn gives safety professionals a more fine-grained look at potential hazards that may otherwise be overlooked.

The significance of HAZOP will be divided into the pros and cons as listed below;

**Pros of Conducting a HAZOP Study**

1. An efficient, knowledgeable HAZOP team can save the company more money than the expense of the condcuting the study
2. HAZOP studies identify hazards and can thus save lives and decrease employee injuries
3. HAZOP teams provide a multi-disciplinary look at various processes

**Cons of Conducting a HAZOP Study**

1. HAZOP studies are very time consuming
2. HAZOP teams take a very focused approach to each element of a process and may miss some of the hazards that are more evident from taking a bigger picture perspective
3. A team that is not led by a competent facilitator and composed of knowledgable, experienced members may not investigate the processes thoroughly enough or may fail to identify some of the potential hazards
4. **With the aid of a block diagram,list the components of hazard operability.**

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