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HAZOP - Before You Start

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In 1998 we published a [GCI Tech Notes](#) that summarized the HAZOP process. Recently I had the opportunity to teach a class on performing HAZOPs to a group of safety professionals in Shanghai, China. As a result of that experience further information on the process of performing HAZOPs will be presented in a new series of GCI Tech Notes. This is the second in that series.

Introduction

Presuming that you have examined the pros and cons of performing a HAZOP vs. another type of hazard identification process the next step is to gather information that will be needed prior to commencing the actual HAZOP process. An accurate and complete design of the process that will be examined is critical to the success of the HAZOP process. Doing a thorough job of gathering this information in advance of commencing the HAZOP itself can save time and money that would be wasted if it becomes necessary to repeatedly pause or even redo portions of the HAZOP as members of the team realize the information gathered in advance is incomplete or out dated.

Prerequisite

The boundaries of the object or system of the study and the interfaces at the borders needs to be established well in advance in order to facilitate the gathering of information needed for the HAZOP. This process should result in a clear statement of the scope and objectives of the HAZOP study that will be performed.

In general, HAZOP studies seek to identify all hazards and operating problems regardless of type or consequences. Focusing a HAZOP study strictly on identifying hazards can enable the study to be completed in shorter time and with less effort but much of the benefits that make a HAZOP uniquely cost effective may be lost. The following factors should be considered when defining objectives of the study:

- The purpose for which the results of the study will be used.
- The phase of the life cycle at which the study is to be carried out.
- Persons or property that may be at risk, for example employees, the general public, the environment, the system.
- Operability problems, including effects on product quality.

- The standards required of the system, both in terms of safety and operational performance.

Basic Information Needs

As a basis for the HAZOP study the following types of information should be available depending on the specific nature of the process that will be examined:

- Process flow diagrams.
- Piping and instrumentation diagrams (P&IDs).
- Layout drawings.
- Material safety data sheets for any hazardous materials used or produced by the process.
- Provisional (our current for an existing operation) operating instructions - often referred to as SOPs (Standard Operating Procedures).
- Heat and material balances.
- Equipment data sheets and specifications.
- Start-up and emergency shut-down procedures.

All design documentation should be clearly and uniquely identified, approved and dated. The design descriptions for programmable electronic data systems may include data flow diagrams, object-oriented design diagrams, state transition diagrams, timing diagrams, and/or logic diagrams. Remember that even if the process that is being examined is not a software or programmable logic system in and of itself, it likely contains some and perhaps many of these systems as part of the overall control and monitoring of the operation. As such, including these systems is likely to be a critical part of the overall HAZOP process.

Additional Information

The following additional information can also be helpful if obtained in advance of the start of the HAZOP review.

- The environmental conditions in which the system will operate.
- Operating and maintenance personnel qualifications, skills and experience.
- Operational and maintenance knowledge and known hazards with similar systems.

Next Up - Management of the HAZOP Process and Team