

from experience

Understanding the Process Hazard Analysis (PHA)

Required by the Environmental Protection Agency (EPA) for a chemical accident prevention program (40 CFR Part 68) and OSHA's Process Safety Management (PSM) program (29 CFR 1910.119), the Process Hazard Analysis (PHA) is designed to identify and analyze potential hazards associated with the processing and/or handling of toxic, reactive, flammable or explosive chemicals. For food processing industries, applications of the PHA include management of highly hazardous chemicals such as ammonia, oxidizers (hydrogen peroxide) or CIP/sanitizer chemicals, or flammable and combustible liquids such as ethanol or concentrated flavors. PHAs must be conducted when systems exceed threshold quantities of EPA listed chemicals, or based upon other rationales that impact environmental, employee or process safety. PHAs help companies:

- Evaluate potential causes and effects for fires, explosions, releases and spills of the hazardous chemicals on-site.
- Assess the mechanical reliability of the involved processing systems.
- Implement and update emergency preparedness plans.
- Ascertain that employees are being appropriately trained on the risks, safe use and management of hazardous chemicals.

Although there are multiple ways to approach the completion of a PHA, the method used must be appropriate for the complexity of the process involved. Hixson has found the following two methods cover most situations for food or food ingredient processing companies:

- **The What if/Checklist** is a methodical, organized, brainstorming exercise to help identify hazards. In this method, a review team, comprised of experts representing various disciplines as well as individuals familiar with the reporting method, first performs a detailed examination of the entire operation. During the examination, the team generates a list of "what-if" scenarios that would create hazards and safety issues. Next, the team brings the checklist component into the equation to help fill in the gaps that may have occurred during the brainstorming process, and identifies the likelihood, risk and actions for addressing each scenario. Recommendations based on these findings can then be made to determine the course of action. These recommendations become the basis for the hazard reporting process.
- **A Hazard and Operability Study (HAZOP)**, which is usually employed for more complex systems, is appropriate for both continuous and batch processes and can be used at any stage in the life of a process. A HAZOP is conducted by a cross-functional team, which includes members knowledgeable about operations, maintenance, and environment, health and safety (EH&S), as well as individuals knowledgeable about the HAZOP method. Looking at parameters such as pressure, temperature, flow and chemistry, the team outlines the original design conditions, deviation conditions, and causes and consequences of the deviance between the two states. After weighing the benefits of any existing safeguards, the team then makes recommendations for reducing hazard potential.

While the PHA focuses on a broad scope including equipment, instrumentation, utilities, human actions, and external factors that may affect process safety, it does not apply to food safety or human factors analysis/reporting requirements. Those items are covered by other regulations and standards and must be addressed separately.

experience in brief

Finding a few hours of time for a group of people to meet is not the only "to do" involved in conducting a successful PHA. Some other practical tips to remember:

1. Assign a trained PHA moderator to prompt questions and vet responses.
2. Assign a person to be the dedicated scribe for the PHA session.
3. Provide basic PHA training to participants so they understand what is expected and required.
4. Keep participants engaged in the PHA process; be reasonable about the length of the sessions.

continuing education

Hixson associates regularly participate in continuing professional education events across the country. To learn more about the events listed below,

e-mail Hixson at:
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