Master Brewers Safety Toolbox Talk

Expanded Toolbox Talk: Job Hazard Analysis 2.0

INTRODUCTION

Hazard identification is a fundamental piece of every successful safety program. Employee recognition of work-related hazards is essential to injury prevention. To identify safety hazards, we need to assess the workplace. A formal, systematic process of performing this assessment is called a **Job Hazard Analysis** (JHA). At its core, a JHA involves identifying the following:

The steps involved in specific job or task.

The potential hazards associated with each step.

Protective measures used to ensure worker safety while performing the job or task.

An introduction to this process is contained within the Toolbox Talk, "Job Safety Analysis." Additional resources can be found in the Toolbox Talk titled "Risk Management Program and Process Safety Management." This expanded discussion of Job Hazard Analysis will present an in-depth review of the topic, including case study-style examples.

A Job Hazard Analysis performs several purposes within a safety program. First, it provides a formalized method for recognizing & resolving hazards in advance. Ideally, we can identify the potential for hazards before they are even introduced and build in appropriate control measures. For example, introducing a new chemical to the brewery's clean-in-place program should trigger a safety review for chemical compatibility, handling & storage requirements, and employee communication. Similarly, installing a new piece of equipment such as a centrifuge or keg filler has obvious quality & production aspects, but it also involves an assessment of lock-out/tag-out (LOTO), pressure management, machine guarding, chemical handling, and other safety implications.

Another significant advantage to implementing a JHA process, often overlooked, is that it provides a framework for a Return-to-Work program. Understanding and documenting a detailed breakdown of work tasks within a job or specific position allows for an informed assessment of what operators can and cannot do when returning with work restrictions. These restrictions may apply to an injury outside of work, a workplace injury and an accommodation for a disabled worker.

Job Hazard Analyses also allow for reviewing existing operations and setting up an ongoing review process through Key Performance Indicators (KPIs). By understanding where safety-related friction points exist, breweries can track performance of current safety procedures and identify areas for improvement. Identifying hazards is usually the first step in resolving them, and our goal should always be to mitigate

hazards before they result in injury. This process starts with two key components: Hazard Recognition and Control Measures.

HAZARD RECOGNITION

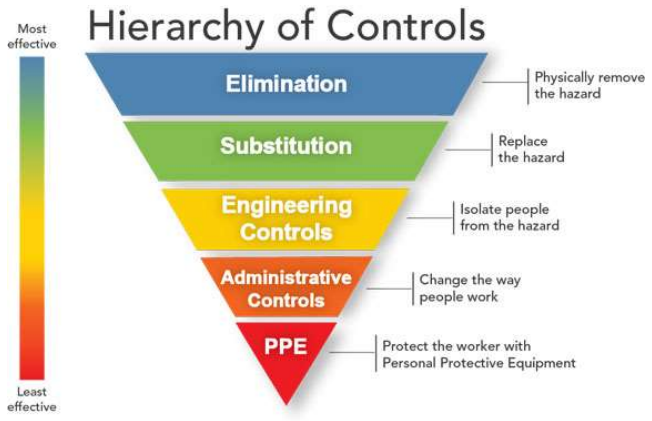
Hazard recognition is comprised of two parallel evaluations. Both involve breaking a task into its subordinate components or steps, and then assessing all potential hazards. The first evaluation track looks for material/physical hazards. These are hazards inherent to the material itself. A classic example is a corrosive cleaning agent, but other examples include carbon dioxide, moving machinery, and pressurized vessels.

The second evaluation is intended to assess process or procedural hazards. These are hazards caused by how operators use or interact with materials and equipment. This should not be confused with *misusing* materials: a process hazard assessment should review the safety implications of both performing a task correctly and ways an operator may make an error that introduces a hazard. Key examples would include the use of a powered industrial truck/forklift, confined space entry procedures, equipment maintenance, and ergonomic practices throughout the brewery.

Frequently, these evaluations will overlap and identify related issues. The reason it is important to conduct both reviews is that it sheds light on the next phase of a JHA: Control Measures. Understanding exactly how these hazards present in the workplace allows us to implement the most effective methods for controlling the hazards.

CONTROL MEASURES

Once we understand what hazards are present in the workplace, we can begin implementing controls. An important concept here is the Hierarchy of Control.



This framework involves how & where to apply controls. Control measures are best implemented as high up in the hierarchy as possible to maximize effectiveness. In practical terms, a combination of controls will be used.

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Let us look at clean-in-place procedures as an example:

Elimination	Corrosive chemicals have a place within CIP operations, so they can't be eliminated entirely. Since elimination isn't an option, a different control is required, such as shifting to the use of the lowest practical quantity and concentration.
Substitution	Looking at alternative chemicals or concentrations is a valuable exercise. Do you actually require a high concentration of nitric acid in a cleaning formulation to perform the task, or would a lower concentration work just as well? Could a phosphoric acid blend be substituted? For a sanitizer such as peroxyacetic acid (PAA), it can be purchased as a 35% solution, but a 5-10% formulation may be better suited for your operation. Substituting lower chemical concentrations limits the level of injury, period. While it may save a dollar to buy the excessively concentrated chemical, you may spend five dollars for adequate PPE or ten dollars for an engineering control.
Engineering Controls	For CIP operations, minimizing the potential for chemical exposure is directly related to reducing the hazard. One option would be a point-of-use dispensing system with a dedicated CIP system, but this isn't always possible for a brewery's financial or space budget. In these cases, transport via buckets is the norm. Using covered and sealed buckets provides an engineering control, offering more protection than an open bucket. Many compounds, notably sanitizers like PAA or chlorine dioxide, produce noxious fumes. These need to be controlled via some form of ventilation or other respiratory protection.
Administrative Controls	Creating Standard Operation Procedures (SOPs) that prioritize safe working practices help to establish a measure of control in situations that cannot be engineered away. Conducting effective Hazard Communication training helps to make operators aware of the risks they face when working with corrosives. Reading the product's Safety Data Sheet is the most important thing every worker will do.
PPE	Safety glasses, rubber boots, and chemical-resistant gloves are often seen as the primary form of protection from chemical exposure, but they are the least effective and function as a last line of defense. In the Safety Data Sheet, all the other controls above are listed before the use of PPE is even mentioned (Section 8 Exposure Controls/ Personal Protection).

Engineering controls can be categorized roughly as active, passive, or environmental. Active controls are items such as machine e-stops and light curtains, while passive measures include things like boil-over sensors, pressure relief valves, and machine guarding. Dust control systems, CO_2 monitors, and ventilation solutions fall under environmental controls. Ergonomic solutions such as self-levelling pallets, lifting aids, and elevated work platforms fall somewhere in the middle, but are important to consider for process hazards.

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IMPLEMENTATION

The Toolbox Talk "Job Safety Analysis" is an excellent guide to work through the steps of the JHA process. The implementation of a "JHA Process" has three main components:

- Establishing long-term reviews and assessments
- Evaluating existing operations and hazards
- Setting up change management procedures

Evaluating existing operations is the most obvious part of the JHA process and the most time-consuming. Documenting the safety picture within the brewery is a daunting task we can break down into manageable steps. First, injury reports point directly to active hazards. They may not be the most significant issues in the brewery, but they are known problems that offer a useful opportunity to practice the JHA process. Next, review maintenance logs and talk with operators about near-misses. Near-misses provide insight into where safety issues exist but haven't resulted in active cases. A priority list of jobs and tasks can be identified based on these results. From there, completion is a function of working through the list until every task has been evaluated.

Breweries are dynamic spaces: change is a given. Managing that change is an important function of safety in brewery operations. A functioning management of change process is designed to evaluate new materials, equipment, and procedures for potential safety implications. This process should begin as early as possible in the change process and is an integral part of selecting materials and equipment prior to purchase. New procedures should be evaluated in advance of roll-out. More often than not, the hazard analysis will either not show any hazards or identify a familiar set of hazards that can be adapted into existing control measures. In cases where significant hazards are identified, advance warning can influence purchases or installation. At the very least, it simplifies the implementation of effective control measures in a more cost-efficient manner, and before safety problems appear.

Looking out over longer time horizons, every safety program should have a review component. Complacency is a real risk in safety, so checking whether programs are functioning as designed is important. Annual reviews should be scheduled to determine whether operations have changed without a corresponding JHA. In fact, documented annual reviews of programs like Lock-Out/Tag-Out and Confined Space are required. Additional information and guidance can be found in the Toolbox Talk, "Risk Management Program and Process Safety Management."

RESOURCES

Hierarchy of Control

Job Safety Analysis

Risk Management Program and Process Safety Management