

How to Conduct a Job Hazard Analysis (JHA)

Welcome to the latest edition of BMC Protect's premium article series. In this white paper, Dr. Deborah Nelson, PhD, CIH, past president of the American Industrial Hygiene Association (AIHA) and a leading occupational and environmental health and safety expert, summarizes and explores Job Hazard Analyses (JHA) - what they are, why they're needed, and how to conduct a JHA. We hope this information is valuable in protecting your employees and clients.

Hazard vs. Risk

Since terminology is often used in different ways in different areas, let's start by defining some terms to be sure we're using them the same way. In the occupational safety and health world, *hazard* refers to something that can cause harm - usually to people but also to property. Chemicals, physical and mechanical agents, biological organisms, and psychosocial stress all have the potential to cause harm. Examples include acids and solvents (chemicals), heat and radiation (physical), unguarded machinery (mechanical), virus and bacteria (biological), and work organization or shift work (psychosocial stress).

Risk is a measure of the probability and severity of the harm that may occur. Where hazard includes the type and level of harm that can occur (e.g., toxicity, flammability, or corrosivity), risk factors in the likelihood that harm will occur (e.g., low, medium, or high). The objective of *risk assessment* is to determine probability and severity of harm resulting from exposure to a hazard. A risk assessment can be qualitative (moderate chance of carbon monoxide poisoning) or quantitative (25% chance of a blood carboxyhemoglobin level above 9%).

Job Hazard Analysis

Job Hazard Analysis (JHA) is a systematic process of dividing a job (or task) into steps, determining the potential hazards associated with each step, and recommending safe procedures to mitigate the risk of accident, injury, or illness for each. JHAs are a critical component of workplace health and safety. Whether or not a JHA is required by the Occupational Safety & Health Administration (OSHA), it's always a best practice to conduct an analysis of workplace hazards in order to provide the best protection for the people who work in or visit a particular location.

Identifying and Controlling Hazards

Before we look at the specific steps of JHA, let's look at some of the tools available to guide safety officers or others with safety and health responsibilities in identifying and controlling hazards. Some workplace hazards (e.g., unguarded machinery, extreme temperatures, poorly designed work spaces) can be observed independently of specific job hazards. Other workplace hazards may not become apparent without a systematic review of each step required to complete a task. Figure 1 shows a tool used to classify chemical, physical, biological, environmental, ergonomic, and radiation hazards. Once hazards have been identified, the next step is to select appropriate controls, ideally working from the NIOSH Hierarchy of Controls (Figure 2) to select the best options to mitigate hazards of a specific job.



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1	Chemical	19	Sharp / pointed objects	37	Insects/spiders/etc.	55	Design flaw
2	Corrosive	20	Struck by or against	38	Biological toxins	56	Vibration
3	Toxic	21	Caught (in, on, between)	39	Sewage	57	Heavy lifting
4	Acutely toxic / poisonous	22	Falling object	40	Contaminated food	58	Repetitive motion
5	Carcinogenic	23	Confined space	41	Contaminated water	59	Awkward posture
6	Flammable / combustible	24	Electrical hazard	42	Needles / Sharps	60	Stress / fatigue
7	Reactive	25	Energy release	43	Environmental	61	Computer/keyboard
8	Reactive with water	26	Air pressures >30 psi	44	Heat stress	62	Radiation
9	Volatile	27	Slip / trip / fall	45	Cold stress	63	Laser
10	Inert gases / O ₂ deficiency	28	Elevated surface /ladder	46	Weather	64	Ionizing radiation: α
11	Oxidizer	29	Trench/excavation/pit	47	Limited visibility	65	Ionizing radiation: β
12	Cryogenic liquids / frost bite	30	Noise	48	Darkness	66	Ionizing radiation: γ
13	Splash	31	Automatic equipment	49	Sunlight	67	Ionizing radiation: neutron
14	Explosive / shock sensitive	32	Vehicles / traffic	50	Lagoon or water body	68	Psychosocial
15	Pesticide / disinfectant	33	Structural instability	51	Heavily wooded area	69	Shift work
16	Physical	34	Biological	52	High altitude	70	Work Organization
17	Explosion (chemical reaction)	35	Pathogens	53	Ergonomic	71	<i>Other (specify)</i>
18	Explosion (over-pressurization)	36	Animals	54	Over-taxation	72	<i>Other (specify)</i>

Figure 1. Classification of Workplace Hazards

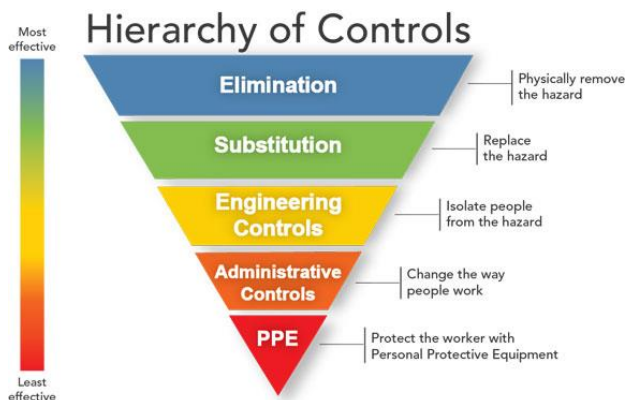


Figure 2. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. (13 January 2015). *The NIOSH Hierarchy of Controls - Overview*. Retrieved 20 April 2021 from <https://www.cdc.gov/niosh/topics/hierarchy/default.html>

As seen in Figure 2, the most effective way to control a hazard is to *eliminate* it completely. If that can't be done, it might be possible to *substitute* safer processes, procedures, and/or materials. *Engineering controls* such as guarding, ventilation, enclosures would be the next option. These controls require maintenance and don't reduce the risk to zero. If the engineering controls can't control the risk to an acceptable level, *administrative controls* might be implemented (e.g., the amount of time a worker is assigned to a particular task might be reduced). Risk remains, but administrative controls can reduce exposure to the hazard. Worker participation, supervision and training are required. If the risk level still remains unacceptably high after implementing engineering and administrative controls, *personal protective equipment (PPE)* would be used to reduce exposure to the remaining risk. Use of PPE to control exposure requires worker participation and a comprehensive PPE program¹ with supervision and training. In other words, as selection of controls moves from elimination to PPE, the effectiveness of control is reduced, and more responsibility is placed on the worker to ensure that the control is used properly.

¹ Refer to OSHA, 29CFR 1910.132 General Requirements [Personal Protective Equipment], available at <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.132>.

Conducting a Job Hazard Analysis

The basic steps of conducting a JHA can be summarized as follows:

- Inspect the workspace to identify and control existing hazards.
- Observe the job and interview the employees.
- List tasks conducted in that workspace.
- Prioritize tasks to be analyzed.
- Sequentially list the steps performed in each task.
- List potential hazards of each step. What accidents could happen?
- Using the hierarchy of controls, identify controls for each hazard.
- Document the process.
- Repeat periodically, especially when the task changes, an employee requests, or there's an accident or near miss.

Observation and discussion with workers are important to conducting a thorough JHA, as they're very familiar with the work being done and often have good insight into the hazards and potential controls. Tasks which are high priority for JHA can be identified from the OSHA 300 Log of Injuries and Illnesses, OSHA 301 Injury and Illness Incident Report, and OSHA 300-Summary of Work-Related Injuries and Illnesses, which can provide a history of previous incidents. Any tasks which have resulted in accidents, incidents, near misses, worker compensation reports, or accident investigations, which involve known hazardous materials or processes, or which are complex enough to require written instructions are top candidates for JHA. Instruction manuals for equipment and trade or professional organizations can also help.

As you're developing your potential hazards, think about what could go wrong. What could happen if people don't follow the recommended safety procedures? What factors would contribute to accidents or exposures? How likely are accidents or exposures to occur? Don't forget to consider how weather events or potential emergencies may affect exposure to hazards. Are you in an area prone to earthquakes, severe weather events, or flooding? What would happen in the event of a natural or human-caused disaster?

Safety Data Sheets (SDSs) can be very helpful in evaluating chemical hazards, as they generally include chemical composition and percentage in Section 3 of the SDS. (Exceptions include trade secret information; see 29 CFR 1910.1020 *Access to employee exposure and medical records*, paragraph (f) Refer to OSHA, 29CFR 1910.132 General Requirements [Personal Protective Equipment],

available at <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.132>.

Trade secrets, to learn about accessing trade secret information when necessary to protect worker health and safety.) However, SDSs often provide generic advice such as "use appropriate gloves" or "dispose in accordance with applicable regulations," in which case you may need to contact an industrial hygienist or safety professional.

Documenting a JHA

Conducting a JHA doesn't have to be complicated, but it does need to be thorough, documented, and signed and dated. There are forms available on the Web, but Figure 3 is a simple form that could be adapted for your workplace. Figure 4 presents an actual JHA for bathroom cleaning in the inpatient acute care area of a major hospital.

OSHA Requirements for JHAs

Employers who are subject to OSHA requirements need to conduct hazard assessments to determine if PPE is needed to protect employees. Hazard assessment and equipment selection are addressed in 29 CFR 1910.132(d) *Hazard assessment and equipment selection*².

[1910.132\(d\)\(1\)](#) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

[1910.132\(d\)\(1\)\(i\)](#) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

[1910.132\(d\)\(1\)\(ii\)](#) Communicate selection decisions to each affected employee; and,

[1910.132\(d\)\(1\)\(iii\)](#) Select PPE that properly fits each affected employee.

[1910.132\(d\)\(2\)](#) The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

² Occupational Safety and Health Administration. (n.d.). *29 CFR Subpart I, Personal Protective Equipment, 1910.132 General Requirements*. <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.132>

Organization		Department / Work Area		
Job Description		Name of Task		
Analyst		Date		
Signatures of Team Members				
Sequence of Basic Job Steps	Potential Hazards	Exposure Potential (L, M, H)	Controls and Safe Practices	PPE (Level and details)

Figure 3. Simple Form for Documenting a JHA

Job Location:	<i>Acute Care Inpatient</i>	Analyst:	
Task Description:			
<p>Bathroom Cleaning: Housekeeper cleans every surface with Virex® cleaning solution. Sinks, toilets, and windows/mirrors use other cleaning products. For special precaution rooms, such as MRSA and C. difficile, all surfaces are cleaned a second time after the 10-minute dwell time from the first application of Virex® has been reached.</p>			
Task Steps	Hazards	Hazard Control	
<i>Walls and vents are wiped with a microfiber cloth soaked in Virex® solution.</i>	<i>Prolonged contact with cleaning solution</i> <i>Potential splashes while wiping</i> <i>Biological contaminants</i> <i>Repeated wiping and bending motions.</i>	<i>Chemical resistant gloves</i> <i>Safety glasses/goggles</i> <i>Chemical resistant gloves</i> <i>None</i>	
<i>Shower walls and floor are wiped with a microfiber cloth soaked in Virex® solution.</i>	<i>Prolonged contact with cleaning solution</i> <i>Potential splashes while wiping</i> <i>Biological contaminants</i> <i>Slips from wet surfaces</i> <i>Repeated wiping and bending motions</i>	<i>Chemical resistant gloves</i> <i>Safety glasses/goggles; face shield</i> <i>Chemical resistant gloves</i> <i>Technique preventing overflow; squeegee floors frequently</i> <i>None</i>	
<i>Optional: Power washing of shower walls and floors with Virex® solution.</i>	<i>Product/water sprays</i> <i>Slips from wet surfaces</i>	<i>Safety glasses/goggles, face shields</i> <i>Technique preventing overflow; squeegee floors frequently</i>	
<i>Sink is wiped with a microfiber cloth soaked in Virex® solution or with pre-moistened wipes.</i>	<i>Prolonged contact with cleaning solution</i> <i>Biological contaminants</i>	<i>Chemical resistant gloves</i> <i>Chemical resistant gloves</i>	

Figure 4. Job Hazard Analysis for Bathroom Cleaning in Inpatient Acute Care

An example of steps that would meet these requirements can be found in Appendix B (non-mandatory) of 1910.132: conduct a walk-through survey to identify hazards; organize and analyze the data for probability and severity of potential injuries; select and fit the needed PPE; and reassess as needed. (See Appendix B of Subpart I for additional details.) The signed and dated written certification must be kept at the workplace.

OSHA also states in 29 CFR 1910.132(f) *Training* that before performing work which requires PPE, each employee must be trained to know when and what PPE is necessary, how to safely use and care for the PPE, and the limitations of the PPE. Further, the employee must demonstrate understanding of this training. (See 29 CFR 1910.132 for details.)

OSHA doesn't specify how long these records must be retained; however, legal experts suggest that written hazard assessment certifications and PPE training records be kept for the duration of employment of affected employees (Lies & Morady, 2015)³. (Don't forget that it's the employer's responsibility to ensure that these rules are enforced.)

Team Approach to Conducting JHAs

JHA and hazard control are best conducted through a team approach, in which management, workers, and health & safety staff collaborate. The workers who carry out a task are often the best sources of information about that job, with supervisors and knowledgeable staff members rounding out the team. Workers who participate in JHA and recommending controls are also more likely to promote these controls to their coworkers.

Industrial hygienists and/or safety professionals should be consulted for tasks involving exposures to toxic chemicals, pathogenic microorganisms, high-energy sources, etc., or for tasks which have already resulted in injury or illnesses. If there are no health and safety professionals on staff, professional assistance may be sought from insurance companies, local/state health departments, the state OSHA consultation program, or consultants identified through the American Industrial Hygiene Association (aiha.org) or the local chapter of the American Society of Safety Professionals.

General References

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³ Lies, M.A., & Morady, I.R. (July 2015). OSHA-related documents: Creation and retention. *Occupational Health & Safety*. <https://ohsonline.com/Articles/2015/07/01/OSHA-Related-Documents.aspx?Page=2>