Prioritize Hazards and Select Controls

Ready for Level 2?

	YES (✓)	NO (X)
You have done an initial prioritization of hazards in your workplace	☐	Visit Implement Selected Hazard Controls (1HPC_5)
You have addressed serious or easily fixed hazards right away, using interim controls if necessary	☐	Visit Implement Selected Hazard Controls (1HPC_5)
You have chosen controls for your initial list of prioritized hazards, using the hierarchy of controls, OSHA standards, and other considerations	☐	Visit Identify Control Options and Select Controls (1HPC_1)
You have asked workers how effective the controls are and how they affect their jobs	☐	Visit Select Controls (1HPC_2)
You have evaluated and controlled any new hazards created by the controls	☐	Visit Select Controls (1HPC_2)

To-Do

☐ **Start working on hazard prioritization and selection of controls as interconnected processes.**

☐ **Prioritize newly identified hazards for control, using better ways to assess potential severity and likelihood.**

☐ **Identify and choose controls as high on the hierarchy as possible.**

Setting priorities and choosing controls as interconnected processes

As your program matures, you've gained skill in finding hazards and hazardous situations and controlling them effectively. You can now start prioritizing and controlling hazards *together* as closely related, interconnected activities—part of an overall process of continual improvement in managing risks. For example:

- When you prioritize hazards, you are identifying both the biggest risks and your priorities for working on controls.

- As part of prioritizing hazards, you'll consider the strength of controls already in place.

- Before adding controls or improving ones already in place, you'll identify any new hazards they might create and ways to control them.

- Evaluating the effectiveness of controls gives you input for making them better.

Prioritization and Control
as Interconnected Processes

Prioritize hazards for control

Start by reviewing work you've already done. Here are steps you should already have taken (see Prioritize Hazards for Control [1HI_5]):

- Compiled a list of the hazards you've identified through processes such as inspections, incident investigations, and worker input.

- Fixed any serious hazards immediately, putting interim controls in place if necessary.

- Addressed easy-to-fix hazards right away.

- With the involvement of workers, ranked each hazard according to the chance that it could cause injury or illness, as well as how severe that injury/illness would be.

Now you can build on this previous work.

1. Work on prioritizing newly identified hazards from your earlier work identifying new hazards, including those from emergencies and non-routine activities. These might include:

   - Health hazards, such as long-term exposure to airborne contaminants or ergonomic risks. These can have chronic or long-term effects and are often harder to spot than safety hazards.

   - Hazardous situations that increase risk by affecting the use of controls. A hazardous situation might involve multiple hazards. For example, extreme weather could cause a power outage in a chemical plant, which could affect the ventilation system and lead to a buildup of hazardous chemicals in the air.

   - Changes in how work is done, such as changes in the packaging of incoming materials or the chemical makeup of hazardous materials. Such changes could make controls less effective.

2. Begin using more advanced ways to assess the potential severity and likelihood of injuries and illnesses:

   - **Estimate severity** by considering the worst thing that could (credibly) happen, as well as the number of workers who'd be affected.

   - **Assess the strength of controls currently in place**. Is the current level of control on the hierarchy appropriate for the potential severity of the injury or illness? See Identifying Hazard Control Options: The Hierarchy of Controls. For example, if the severity potential is high, but engineering controls are present, the risk may be low. This would make it a lower priority. If the controls are strictly procedural and low on the hierarchy, the risk would be high, making the hazard a higher priority.
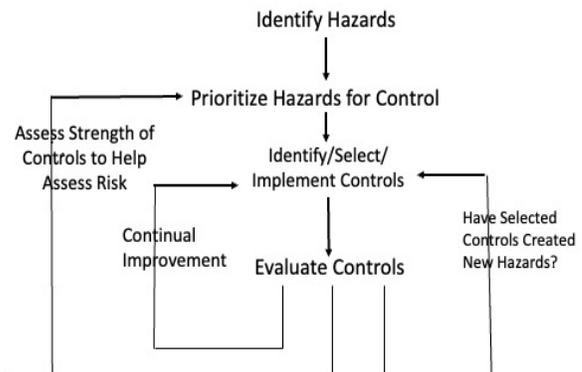
- **Ask "what-if" questions.** For example, if workers are using a flammable solvent to clean production parts, you can ask, "What if the operator is not trained?" "What if ventilation decreases?" "What if there is a nearby source of ignition?" Then look at the potential consequences in each scenario.

- **Review relevant OSHA regulations** to help understand severity of injury and required actions. For example, the Fall Protection standard establishes specific height thresholds past which you must take fall protection measures. Those thresholds are based on the greater severity of injuries when someone falls from higher up.

- **Get expert advice** from individuals or organizations, such as industry associations, insurance carriers, and OSHA's On-Site Consultation Program.

- **Consider the number of workers affected**.

Identifying and choosing controls

In choosing control options (both interim and permanent) for a hazard, try to match the controls to the level of risk. Whenever possible, use high-level controls for high-risk hazards. As you begin at the top of the hierarchy and work your way down, take the following into account:

- The availability and feasibility of industry best practices. Feasibility includes the effectiveness of the technology, the cost of the control(s), and the impact of the control(s) on production. Evaluate how the control would fit into the work environment. How will it affect production? Does it make the job harder for workers? It might be better to spend a little more on a control that has less impact on production, rather than choosing a control that slows down the job or makes it harder. A worker may be tempted to bypass, remove, or not use a control if they are under production pressures.

- Internal organization requirements. Your company's quality standards, production requirements, or safety guidelines may affect your choice of controls. For example, you don't want to add a control that can compromise quality. Enclosing an operation with sheet metal makes observation and inspection impossible. Using plexiglass or a similar material can control the hazard without creating quality challenges.

- Human factors in the workplace. When possible, design controls to fit the broadest range of workers exposed to the hazard. Consider human factors such as workers' physical characteristics, limitations or disabilities, language barriers, age, and level of training and experience.

- Combination of controls for greater effectiveness. As you gain more experience in applying the hierarchy of controls, you'll start identifying combinations of interdependent controls that can work together. For example, if workers manually handle heavy loads, it might be effective to combine lifting aids with training on their use and a procedure that prohibits manual lifting of heavy loads.

- Benefits and costs. When considering costs, consider the long-term as well as short-term costs. For example, a choice between machine guards and ventilation systems should account for the cost of maintaining it as well as buying and installing it. Meanwhile, benefits can include lower risk of injury or illness, higher productivity, better morale, and compliance with legal requirements.

Be sure to review reliable sources of safety and health information. These include OSHA standards and guidance materials, relevant industry consensus standards, trade association materials, manufacturer's instructions, National Institute for Occupational Safety and Health (NIOSH) publications, etc. Also remember that workers often have key insights on what control options work better than others. Engage with them to better understand the process and organizational factors that influence how work is actually done. Make sure they understand that OSHA or other standards may **require** a specific control to mitigate a hazard.

# Case study: Identifying chemical hazards and selecting new controls

At a small manufacturing company, workers in the production and packaging areas were exposed to solvents, pigments, and resins. The company was providing workers with personal protective equipment (PPE), including gloves and safety glasses. But workers told management they were getting rashes, apparently related to chemical exposures. They also reported odors and headaches when working in the production area. The company increased ventilation as an interim measure and made it a priority to assess the hazards and figure out appropriate controls.

The company hired an industrial hygiene expert to conduct a hazard assessment. A consultant was available immediately and there did not seem to be an imminent danger, so the company did not shut down the process. The assessment confirmed that exposure to the solvents was hazardous to workers' health. Workers were being exposed at levels that could indeed irritate skin and cause breathing and neurological problems.

The company reviewed its hazard control plan, which included a list of hazards and the priorities for implementing controls. The consultant's findings confirmed that addressing solvent exposure should be a high priority. The potential effects were worse than those from other hazards on the list, and most of the workers in the company were exposed.

The company worked with the consultant to choose the best controls for its situation. Workers and managers looked at the pros and cons of the following alternatives:

- Use of safer solvents **(substitution).** The consultant helped the company identify a different solvent that could be used without work procedure controls or PPE.

- Local exhaust ventilation systems **(engineering controls)** to capture and remove the chemicals in the air. This was determined to be costly and time-consuming. As well, it did not address skin contact with the chemicals—the source of the complaints.

- Work procedures **(administrative controls)** to limit exposure time and provide more frequent breaks. These were deemed not practical given work flow and production demands.

- Changing the **PPE** in use. The gloves and safety glasses were not preventing skin contact. The consultant made recommendations for better selection and fit of gloves and respiratory protection.

Most effective

Hierarchy of Controls

Least effective
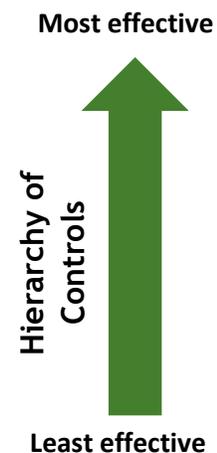
The company knew that choosing a control as high as possible on the hierarchy was the best way to protect workers. The use of a safer solvent was the highest on the hierarchy. It was also the most practical solution under the circumstances.

The company tested the new solvent and got worker input, then switched to using it. The company also began following the consultant's recommendations for better selection and fit of gloves. The company made a plan to get worker feedback over time about this combination of controls and their impact on work-related health issues.

The diagram below shows the steps the company took in prioritizing the hazards and choosing controls.
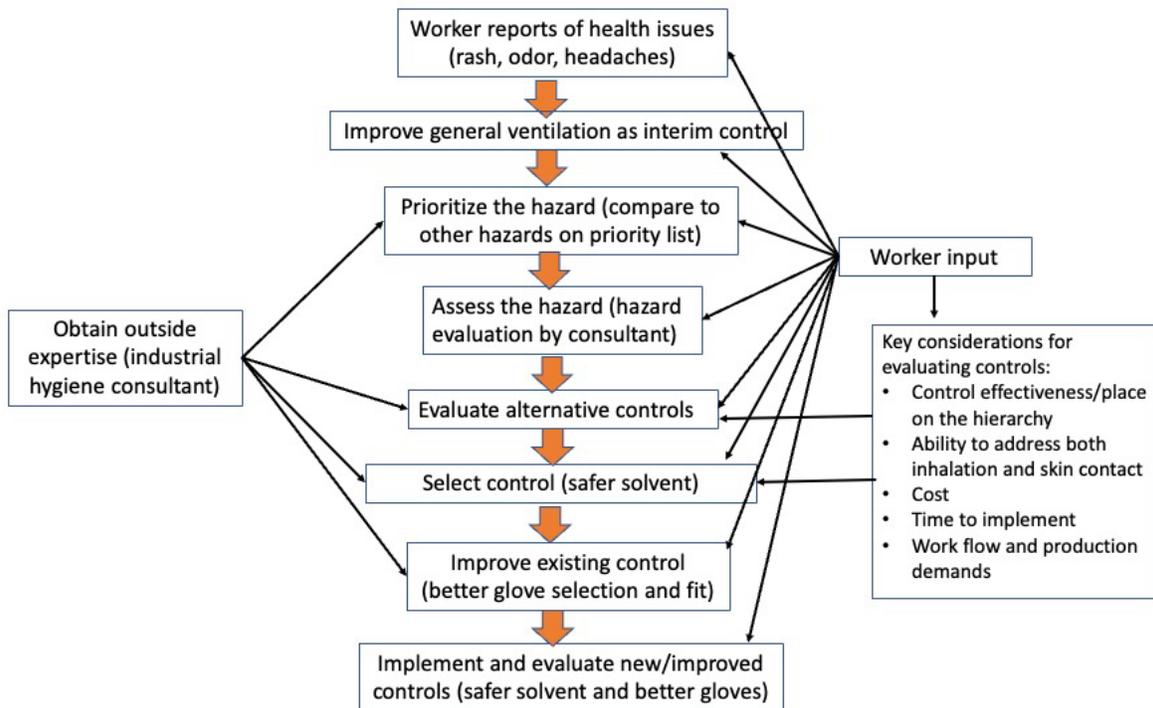
Activity

Choose one of the following activities to work on selecting controls. Option A is more visual, involving creating a diagram. Option B involves brainstorming controls for a short list of hazards.

Activity option A: Picture your steps for choosing a control

1. Pull together a small group: workers, supervisors, an engineer, etc.

2. Choose a high-priority hazard from your list of hazards.

3. Using flip chart paper and markers (or sticky notes, which you can move around), diagram the steps you will follow to choose control(s) for that hazard.

   - Remember to start at the top of the hierarchy when brainstorming potential controls, then work your way down.

   - Also take into account the other considerations described in this worksheet. (For example, industry best practices, human factors, costs and benefits, and internal organizational requirements.)

4. You can use the diagram from the case study above as an example, but feel free to change or add to it to suit the hazard you've chosen and your situation.

5. Keep your list of considerations. You can build on it when selecting controls for other hazards.

Activity option B: Rank hazards, brainstorm, and select controls

1. Pull together a small group: workers, supervisors, an engineer, etc.

2. Choose two or three new hazards not ranked on the priority table in Prioritize Hazards for Control (1HI_5).

3. Ask the group to rank each hazard as high, medium, or low.

4. Ask the group to list the things they considered in ranking the hazards.

5. Choose a high-priority hazard from your list.

6. Brainstorm potential controls.

7. Starting at the top of the hierarchy, discuss the controls and choose the most effective combination of them (see "Identifying and choosing controls" above).

8. List the things the group considered in choosing that combination. Keep in mind the considerations described in this worksheet. For example, consider level of risk reduction, industry best practices, human factors, costs and benefits, and internal organizational requirements.

9. Keep your list of considerations—you can build on it when choosing controls for other hazards.