CALGARY SAFETY CONSULTANTS

# Hierarchy of Controls

## Quick Guide and Checklist

The hierarchy of controls is the order used to choose controls: eliminate, substitute, engineer, administer, then protect. Start at the top, work down in order and record the basis for any higher-order control not selected. Use the governing jurisdiction's legal test and combine controls where one is not enough.

### THE FIVE LEVELS: MOST EFFECTIVE TO LEAST EFFECTIVE

| 1. Elimination | 2. Substitution | 3. Engineering | 4. Administrative | 5. PPE |
|---|---|---|---|---|
| Remove the hazard completely. | Use something less hazardous. | Isolate people with guards, ventilation, barriers. | Procedures, permits, training, scheduling. | Protect the worker with equipment. |

## Define the hazard and rate it first

- [ ] The hazard is a specific statement of what could go wrong, for whom, during which task, such as "solvent vapour from hand-wiping parts in an open tray," not just "chemicals."
- [ ] The energy source is named: gravity, motion, mechanical, electrical, pressure, temperature, radiation, sound, chemical, biological, ergonomic or psychosocial.
- [ ] **Initial risk is rated before any controls** (Likelihood x Severity = Risk).

## Work down from the top

- [ ] **Elimination** was considered first: can the task, material or hazard be removed, or the work done another way?
- [ ] **Substitution** was considered, and any substitute's hazards were checked on its safety data sheet before switching.
- [ ] **Engineering controls** were considered: guarding, interlocks, ventilation, barriers, enclosures, guardrails, mechanical aids.
- [ ] **Administrative controls** support the higher controls: written procedures, permits, training, scheduling, supervision. "Be careful" isn't listed as a control.
- [ ] PPE is selected for the hazard, fitted, maintained and supported by training and supervision. It should not be the only control for a serious hazard unless higher-order controls have been considered first and the basis is documented.
- [ ] The governing legal test and terminology were confirmed. Workers who do the task helped choose and verify the controls.

### WORKSHEET RISK BANDS (USE YOUR APPROVED METHOD IF YOU HAVE ONE)

| LOW 1 to 4 | MODERATE 5 to 9 | HIGH 10 to 16 | EXTREME 17 to 25 |
|---|---|---|---|
| Maintain controls and monitor. | Improve controls where practicable; supervisor review. | Additional controls required before work begins. | Do not proceed until the risk is reduced. |

**Why the order matters.** Elimination, substitution and engineering controls act on the hazard itself and keep working whether or not anyone remembers them. Administrative controls and PPE act on people, so they depend on everyone doing the right thing, every time. Most jobs need controls from more than one level.

General information, not legal advice. Occupational health and safety requirements differ between provinces, territories and federally regulated workplaces, so confirm the requirements that apply to your workplace.

## Check the result

- [ ] Residual risk is re-rated with the controls in place, and nothing is left high or extreme. If it is, go back up the hierarchy or change the job.
- [ ] New hazards created by the controls are assessed, such as a substitute chemical's hazards, a pinch point, a blocked exit or heat stress under PPE.
- [ ] Each control has a person responsible and a target date.

## Verify and keep checking

- [ ] Every control is confirmed in place before work starts, not just written down.
- [ ] Engineering controls are on an inspection and maintenance schedule, with records.
- [ ] Monitoring is done where the hazard can be measured, such as noise levels, air sampling and ventilation flow.
- [ ] Supervisors observe that controls are used as intended, and workers are asked whether the controls get in the way of the work.
- [ ] Critical controls for hazards that could kill or seriously injure someone are checked at the start of each job or shift.
- [ ] Controls are reviewed when the work, equipment, materials or people change, after an incident or near miss, when inspections or monitoring find a problem, and on schedule.

## Red flags to avoid

- [ ] Our assessments don't end every hazard with PPE and training.
- [ ] No assessment lists awareness, such as "be careful" or "stay alert," as the control for a serious hazard.
- [ ] Every assessment shows the initial risk as well as the residual risk.
- [ ] Incident corrective actions go beyond "retrain the worker" when a higher control was available.

**How to document control selection**
Record the seriousness and likelihood of harm, what is known about the hazard and available controls, whether each control is suitable, the governing legal test and the basis for the decision. Higher risk normally requires stronger controls. Confirm the jurisdiction's exact terminology before using this guide.

**Need help choosing controls?** Calgary Safety Consultants helps employers with hazard assessments, JHAs, safe work procedures and audit preparation. Read the full guide at calgarysafetyconsultants.ca/safety-guides/hazard-management/hierarchy-of-controls/ or call 1-888-231-0358.

General information, not legal advice. Occupational health and safety requirements differ between provinces, territories and federally regulated workplaces, so confirm the requirements that apply to your workplace.