

This Guideline relates to the
[Hazard Identification, Risk Assessment and Control \(HIRAC\) Framework](#)

1. Introduction

The university's primary tool for hazard management is the *Hazard Identification, Risk Assessment and Control* (HIRAC) review process. The HIRAC process is best suited to **tasks** or **activities**, as opposed to **workplace** hazards. Workplace hazards are best identified, assessed, and controlled through regular workplace inspections integrated within the relevant Institute/Directorate's [Annual OHS Plan](#) (see [6. Workplace Inspections](#)).

Note also the terms used to describe a structured review of hazards and risks may differ across various industries. For instance, the process mandated in the building and construction industry for high-risk construction work (HRCW) is named "[Safe Work Method Statement](#)" (SWMS). (See [Safe Work Method Statement for Contractors](#) and [Safe Work Method Statement for Staff and Students](#)). In other industries such as mining, the term "[Job Safety Analysis](#)" (JSA) may be preferred.

However, these differences in wording should not distract from the fact the principles and end goals are identical: to identify what could cause injury or ill-health in a task and to eliminate or minimise these risks prior to beginning the work. All these processes require consultation with the workers engaged in the task and their Health and Safety Representative(s) if applicable.

2. Selection

First, select a **task** or **activity** for review. Give priority to tasks or activities that present special risks, based on:

- past experience (e.g. accidents, near-misses, complaints)
- professional or scientific knowledge regarding inherent hazards associated with chemicals or equipment used, hazardous environments
- concerns expressed by staff
- requirements of legislation or University policies and procedures (e.g. workplace changes)
- requests from the various Health and Safety Teams, etc.

3. Hazard Identification

Hazards can be grouped under various categories, as listed below. The following categories provide examples, but don't limit yourself to these. Brainstorm with other participants to identify potential hazards:

Bio-mechanical and Postural

Note: where the main hazards associated with an activity or task relate to manual handling, use the [specialised HIRAC form](#).

- Repetitive or sustained postures, movements or forces as listed below for more than thirty minutes at a time, or for more than two hours over a workday.
 - Excessive bending or twisting of back or neck in any direction.
 - Working with hand(s) above shoulders
 - Reaching to front/side more than 30cm from body.
 - Reaching behind body
 - Squatting, kneeling, crawling, semi-lying or jumping.
 - Standing with most of body weight on one leg
 - Twisting, turning, grabbing, picking or wringing actions with fingers, hands or arms.
 - Working with fingers close together or wide apart.
 - Very fast movements
 - Excessive bending of wrist(s)
 - Carrying with one hand or one side of the body
 - Pushing, pulling, dragging, holding or restraining

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- High-force actions as listed below
 - Lifting, lowering, or carrying heavy loads
 - Applying uneven, fast, or jerky forces
 - Sudden/unexpected forces
 - Pushing/pulling objects hard to move or stop.
 - Awkward grips
 - Throwing, catching, hitting, kicking, or jumping
 - Holding, restraining, or supporting person, animal, or heavy object

Physical Environment and Workplace Design

- Poor housekeeping, uncontained spillages or wastes
- Uneven or slippery work surfaces
- Obstacles in passageways, near equipment, risk of collision with stationary objects, etc
- Inadequate work platforms, stairs, ladders, guardrails, harnesses, etc, for work at height
- Personnel access within two metres of edge of roof, high place of work, etc
- Unprotected openings or gaps in walkways and platforms
- Poor lighting
- Exposure to harmful noise levels
- Confusing or inadequate labelling of controls
- Mismatch between plant, workplace, office workstation design, activity or task and user physical characteristics (height, strength, speed, mobility, fitness, etc)
- Body parts coming in contact with hot components during testing, inspection, operation, maintenance, cleaning, or repair
- Exposure to campfires and hot items from fires
- Fall or collapse of ground, materials, plant, structures, etc.
- Exposure to extremely cold materials or components (e.g. dry ice)
- Exposure to radiation (ionising and non-ionising, lasers)
- Entry into cool rooms

Mechanical

- Hair, clothing, jewellery, rags, etc, liable to become entangled in moving components
- Uncontrolled or unexpected movement of machinery, components, work pieces, vehicles or loads
- Inability to slow, stop or immobilise machines, vehicles
- Body parts coming in contact with moving, crushing, sharp, or hot components during testing, inspection, operation, maintenance, cleaning or repair
- Possibility of traffic accident
- Persons or body parts trapped or sheared between moving component and fixed plant, materials or structures
- Persons pushed, pulled or thrown off plant, structures
- Machines, components, or materials disintegrating (e.g. grinding wheels)
- Components, work pieces, fluids, etc, being forcefully ejected
- Persons being injured by damaged, poorly maintained or unguarded equipment (including electrical components)

Electrical

- Contact with "live" components during testing, inspection, operation, maintenance, cleaning or repair
- Contact with overhead power lines
- Contact with underground power cables
- Explosion or ignition of electrical components, etc.
- Unauthorised access to electrical services, switchboards, controls, etc.

Chemicals and Toxicity

- Explosion or ignition of gases, vapours, liquids, dusts, etc
- Exposure to toxic concentrations of chemicals (skin, inhalation, ingestion, etc.)
- Exposure to oxygen-depleted atmospheres
- Damage to gas lines, compressed gas cylinders, chemical storage containers, etc.

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Biological and Human

- Exposure to venomous or dangerous animals
- Exposure to toxic natural substances (plant, mushrooms, gases, etc)
- Exposure to (potentially) infectious substances
- Accidental collision with another person
- Assault by another person (*Note: where workplace violence is being reviewed, special risk assessment forms should be used. Contact the [Health, Safety and Wellbeing team](#).*)

Organisational and Procedural Arrangements

- Insufficient first-aid equipment or trained personnel
- Insufficient evacuation, emergency or rescue planning and facilities
- Access to hazardous equipment by unauthorised or untrained people
- Insufficient job rotation, rest breaks
- Inappropriate, insufficient or poorly maintained personal protective equipment

Psycho-social Environment and Task Design

- Insufficient consideration given to the probability of human error and its consequences
- Lack of clarity in work roles of employee(s)
- Lack of control or recognition in work roles of employees
- Mismatch between task demands and workers'/people's behaviour or capabilities
- Insufficient consideration given to consultation prior to workplace changes

Natural Environment

- Drowning or being swept away by fast-flowing water
- Bushfires
- Persons becoming lost, injured or ill in remote locations.
- Possibility of falling from a height, down a steep incline, a cliff face, a ravine or crevasse, etc.
- Persons being engulfed in loose or crumbling ground, sand, snow, etc.
- Being struck by falling objects (e.g. tree limbs, overhead rocks)
- Collision with stationary objects at high speed (skiing, mountain biking, etc.)
- Equipment failure
- Exposure to extreme environmental conditions (hot, cold, dry, wet, snowy, windy, stormy, etc.)
- Lightning in exposed locations

4. Risk Assessment

Risk assessments are based on two key factors:

- the consequence of any injury/illness resulting from the hazard, and
- the likelihood that the injury/illness will actually occur

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Medium	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

For further details and definitions on conducting a risk assessment, refer to the University's [Risk Assessment Guideline](#).

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5. Risk Control

Urgent action is required for risks assessed as **Extreme**. The actions required may include:

- instructions for an immediate stop the work, process, activity, etc.
- isolation of the hazard until more permanent measures can be implemented.

Document actions taken to address an **Extreme** risk by lodging a Hazard/Near-Miss Report in [Workday](#).

For **High** and **Medium** risks, document the risk control plan with responsibilities and completion dates in the [HIRAC Report](#). (Refer also various specialised HIRAC forms available in section 3.1 of [HSW Forms, templates and records](#)).

Risk Control Hierarchy

The risk control hierarchy ranks risk control measures in **decreasing** order of effectiveness. Risk control measures should always aim as high in the list as practicable. Control of any given risk generally involves several measures drawn from the various options (unless the hazard can be eliminated).

- A. Elimination of hazard: examples include the proper disposal of redundant items of equipment that contain substances such as asbestos or PCBs, the removal of excess quantities of chemical accumulated over time in a laboratory, etc. The elimination of hazards is 100% effective.
- B. Substitution of hazard: examples include the replacement of solvent-based paints with water-based ones, of asbestos insulation or fireproofing with synthetic fibres or rockwool, the use of titanium dioxide white pigment instead of lead white, etc. The effectiveness of substitution is wholly dependent on the choice of replacement.
- C. Engineering controls: examples include the installation of machine guards on hazardous equipment, the provision of local exhaust ventilation over a process area releasing noxious fumes, fitting a muffler on a noisy exhaust pipe, etc.
- D. Administrative controls: include training and education, job rotation to share the load created by demanding tasks, planning, scheduling certain jobs outside normal working hours to reduce general exposure (e.g. planning demolition and building works during summer recess), early reporting of signs and symptoms, instructions and warnings, etc. Administrative control measures typically require significant resources to be maintained over long periods of time for continuing levels of effectiveness.

“Safe Work Procedures” (SWP) or “Safe/Standard Operating Procedures” (SOP) are common administrative risk control measures. Such procedures are valuable as part of a more comprehensive approach to risk control. However, SWPs/SOPs remain relatively low-level measures that do not reduce the inherent hazards associated with a task. It is therefore generally inappropriate to rely exclusively on a procedure to ensure the safety of workers and students.

- E. Personal protective equipment (PPE): includes safety glasses/goggles, earmuffs/earplugs, hard hats, toe-capped footwear, gloves, respiratory protection, aprons, etc. The effectiveness of personal protective equipment in realistic work situations is quite low. PPE is therefore seen as a “last line of defence” and should be used in conjunction with other risk control measures.

6. Workplace Inspections

Regular workplace inspections can form part of a program for the identification of hazards, and the assessment and control of health and safety risks. They are highly recommended for laboratories, chemical and equipment stores, workshops and gymnasiums, and should be included in Appendix A – HIRAC Schedule of the relevant Institute/Directorate’s [Annual OHS Plan](#).

Several workplace inspection checklists are available in section 3.1 of [HSW Forms, templates and records](#).

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