

# RISK ASSESSMENT PROGRAM

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## 1.0 PURPOSE

The purpose of this program is to outline the University of Waterloo's framework and approach to managing health and safety risks in University workplaces.

## 2.0 SCOPE

Risk assessment is a key component of risk management and can be implemented at various levels and in different contexts. This program addresses risks within the scope of health and safety legislation and the University's health and safety program. Therefore, risk assessment must include an evaluation of relevant regulatory and legal requirements as a course of practice.

This program is applicable to all people carrying out work in University workplaces, including faculty, staff, students, contractors and volunteers.

Risk assessment includes hazards originating inside and outside of the workplace, as part of off-campus work, and during the activities of contractors, suppliers, and visitors. Risk will be assessed in relation to the following situations:

- Routine and non-routine operations and activities
- Proactively prior to commencement of performing any task, prior to the introduction of new equipment, materials, or processes
- As part of a management of change process when there is change to existing equipment, materials, chemicals or processes
- When there is a change to the Health, Safety & Environment Management System (HSEMS), specific health and safety program, or to legislation that may impact on operations, activities or the associated risk of those activities

## 3.0 DEFINITIONS

### **Hazard**

Any source of potential damage, harm or adverse health effects on something or someone.

### **Hazard Register**

An overview document recording a summary of hazards, risk priorities, and risk controls that reflects how risk is managed within each University department.

### **Hierarchy of controls**

A ranking of risk control methods from the highest level of protection and reliability to the lowest.

**Risk**

The chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard. It may also apply to situations with property or equipment loss, or harmful effects on the environment.

**Risk assessment**

The overall process used to:

1. Identify hazards and risk factors that have the potential to cause harm (hazard identification).
2. Analyze the risk associated with that hazard (risk analysis).
3. Determine appropriate ways to eliminate the hazard or control the risk when the hazard cannot be eliminated (risk control).

**Risk control**

The elimination or reduction of risk associated with an identified hazard.

**Residual risk**

The risk remaining after a hierarchy of controls has been implemented.

**Risk rating**

The process using a risk matrix that produces a risk level or priority for the activity. This is a combination of the consequences of a risk and the likelihood those consequences will occur.

**SOP**

Known variously as a Safe Operating Procedure or Standard Operating Procedure, it is a workplace document listing the job, task or process steps, and the risk control measures necessary to perform these steps safely.

**Workplace**

Anywhere where university employees or students conduct work, including work environments in the field or in teaching or research facilities shared with other organizations.

**4.0 ROLES AND RESPONSIBILITIES**

Management commitment at all levels is critical to risk management. Senior leaders need to lead and support the process in their area(s) of responsibility and provide adequate resources for the implementation of the necessary control measures.

**4.1 SENIOR ADMINISTRATORS**

- Establish accountability for the assessment and control of health and safety risks.
- In conjunction with department heads, identify site-level risk assessment and training requirements.
- Provide appropriate financial, human, and organizational resources.

## **4.2 DEPARTMENT HEADS/DIRECTORS/CHAIRS**

- Implement this program in their area of responsibility and accountability.
- Establish site-level risk assessment and training requirements at the supervisor/manager level, including supervisors of graduate student laboratory and field research.
- Consult and communicate with staff and others on the management of workplace hazards/risks, including during onboarding of new management and workers.
- Ensure awareness of hazards in their area of responsibility and that risks are adequately controlled.
- Regularly monitor and review for new hazards and for the effectiveness of risk controls.
- Ensure the Hazard Register is reviewed and updated on no less than an annual basis.
- Allocate resources as required to manage risks.
- Report unmanaged risks to their senior administrator.

## **4.3 SUPERVISORS AND MANAGERS (INCLUDING SUPERVISORS OF GRADUATE STUDENT LABORATORY AND FIELD RESEARCH)**

- Conduct site risk assessments for work under their control. Supervisors of graduate lab research must ensure that all students conducting research projects complete a Laboratory Risk Assessment and have it approved by the supervisor.
- Ensure that workers/students are aware of hazards and that identified risks are appropriately controlled prior to the worker/student starting work or research activities.
- Establish Safe Operating Procedures (SOP's) for high-risk tasks and equipment. Workers/students must be trained on SOP's specific to their assigned work tasks.
- Monitor and review the effectiveness of risk controls.

## **4.4 WORKERS (INCLUDING GRADUATE STUDENTS CONDUCTING RESEARCH PROJECTS)**

- Report any hazards associated with the working environment, work tasks, or activities to their supervisor as soon as becoming aware of them.
- In the case of research students, identify the hazards associated with their respective research projects in conjunction with their academic supervisor to ensure that all identified risks are appropriately controlled prior to commencing their research activities.
- Participate in the development of appropriate risk control measures for identified hazards to eliminate or minimize risk.

- Use control measures as required.

#### **4.5 SAFETY OFFICE**

- Implement, maintain, and provide training on this program.
- Act as a resource to provide risk assessment guidance to ensure adequate completion of the Hazard Register and local risk assessments.
- Advise on appropriate control measures and evaluate their effectiveness.
- Monitor and report on the performance of risk assessment activities.

#### **4.6 JOINT HEALTH AND SAFETY COMMITTEE**

- Review the Hazard Register as part of the process of workplace inspections.
- Identify the hazards and make recommendations.
- Review this program annually.

#### **4.7 DEPARTMENTAL HEALTH AND SAFETY COORDINATORS**

- Assist the department head with the implementation of this program.

### **5.0 PRINCIPLES**

A proactive approach to ensuring a safe and healthy workplace anticipates hazards and risks and implements control measures before work starts or any significant exposure to risk occurs.

Risk must be managed in compliance with legislative requirements set out in the Occupational Health & Safety Act. Other guidance in the form of applicable standards, codes, and best practices should also be considered. The following principles guide this approach (CSA Z1002, 2017):

- Hazard and risk are not synonymous;
- Where hazards exist, risk exists;
- Risk is a function of the severity of harm and the likelihood of the occurrence of that harm;
- Where hazards are eliminated, risk is eliminated; and
- Where hazards exist, risk controls are required.

Within the framework of the Health, Safety & Environment Management System (HSEMS), the University has implemented this Risk Assessment Program comprised of procedures and guidelines supported by training courses and various tools such as checklists and forms.

## 5.1 SOURCES OF INFORMATION AND WORKER PARTICIPATION

Risk assessment will consider information and seek input from:

- Workplace inspections
- JHSC recommendations
- Worker concerns and hazard reports
- Incident investigations and illness/injury records
- WHMIS Safety Data Sheets
- Equipment specifications
- Hazard alerts or bulletins

## 5.2 THE FOUR STEP CYCLE OF HAZARD MANAGEMENT

The hazard management process follows a four-step process as shown in the diagram. At the core of the process is management commitment, and encircling it at all times is the need for worker participation.

The four steps are:

1. **Recognize hazards** – Scan the environment to determine what could cause harm.
2. **Assess risks** - Analyze the potential seriousness of the harm and how likely it is to occur.
3. **Control risks** – Determine and implement the most effective control measures that are reasonably practicable in the circumstances.
4. **Evaluate control measures** – Evaluate and monitor to determine whether controls are working as planned.



**Figure 1: Hazard Management Cycle**

### 5.3 HIERARCHY OF CONTROLS

Risk control must follow the hierarchy of controls. The first aim is to eliminate a hazard, which is the most effective control. If this is not reasonably practicable, risk must be minimized by working through the lower and less effective levels in the hierarchy.

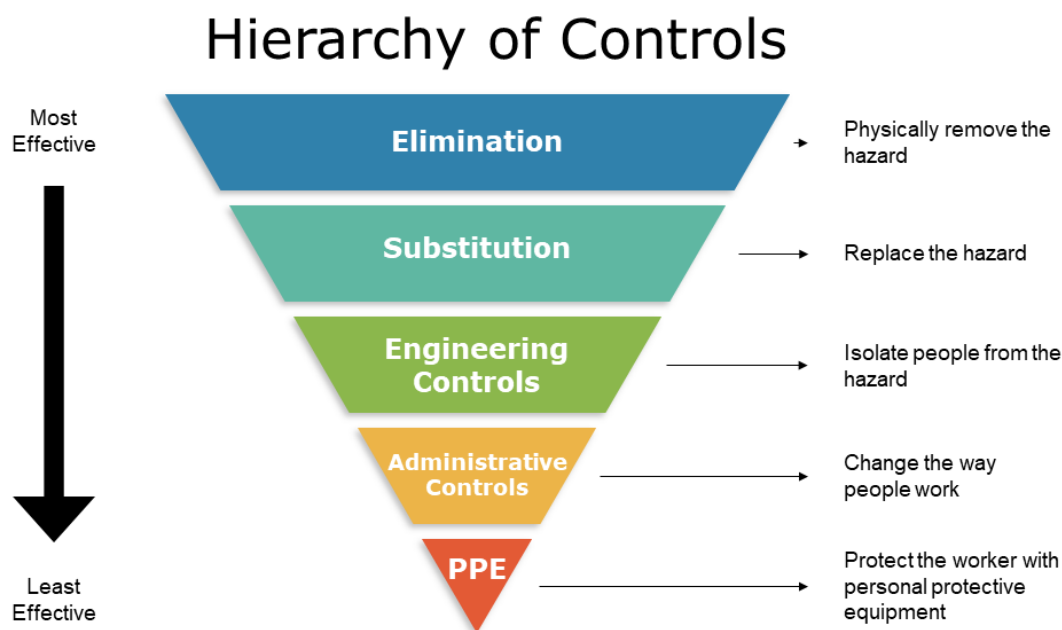


Figure 2: Hierarchy of Controls

## 6.0 PROCEDURES

### 6.1 GENERAL APPROACH TO RISK ASSESSMENT

A team-based approach should be used to conduct the process and facilitate discussion on the risks and controls. The team might include but not be limited to:

- The responsible supervisor
- The person most familiar with the task or item being assessed
- A health and safety coordinator
- Safety Office personnel (should further expert advice be required)

Many hazards and their associated risks have established and accepted risk control measures. Examples of these types of risks include working at heights, confined space, biohazards, and radiation. Formal risk assessment may not be needed for these hazards if they are appropriately managed through adherence to applicable legislation, guidelines, standards, or University programs. Assessment may be limited to an evaluation of compliance to the legislation, standard or program. Evaluation considerations include, but are not limited to, inspections, adherence to procedures,

and training requirements. If there is conformance to the applicable legislation, standard, or program, the risks can be documented as managed.

A responsible person is to sign off the form acknowledging that in their judgement, a sound process has been followed to arrive at risk controls that result in negligible or not significant residual risk. A person with sufficient authority will need to approve resources for controls that need to be implemented (E.g., expenditure for extra guarding on equipment).

## **6.2 THE HAZARD REGISTER**

The Hazard Register is to be used by department directors/chairs/heads to evaluate, prioritize, and monitor overall management of hazards and risks that exist within a unit under their control. It is an overview document recording a summary of hazards, risk priorities, and controls required across the department. The Hazard Register helps the department director/chair/head meet their responsibilities in managing risk. Actions identified in the Hazard Register to introduce or improve risk controls must be tracked and the completion of each prioritized control documented.

Day-to-day hazards, which are easily fixed as a matter of course, would not normally be entered into the Hazard Register. Conversely, if a significant hazard is identified and cannot be fixed immediately and safely by a competent person, the work/activity must be stopped and immediate action taken to correct the hazard. The Hazard Register may need to be updated to reflect the controls that will be/have been implemented.

The Hazard Register should be a communication and competency tool for department directors/chairs/heads to review with supervisors, with the purpose of educating and affirming compliance with the risks and controls documented within it. The Hazard Register should be revisited regularly in consultation with workers.

## **6.3 SITE RISK ASSESSMENT - MANAGING RISK FROM SPECIFIC HAZARDS**

While the Hazard Register facilitates the overall risk management of categories or types of hazards within a department, individual hazards must be managed by responsible managers/supervisors and those with specific accountabilities. For example, machinery may be a category of hazard within a department, but each type of machinery must be individually assessed by the responsible supervisor.

Ideally, hazards should be managed before they enter the workplace or before work starts, in planning or procurement phases of work. When this is not possible, risk must be assessed during operations.

To support this program, a variety of tools, forms, and checklists are available. Health and safety program documents, standards, and guidelines on the Safety Office website also provide guidance for managing a range of hazards.



Specific site risk assessment forms are listed below. Supervisors should select the one most appropriate to the work and phase of operations:

**General use:**

- [Job Hazard Analysis \(JHA\)](#) is a tool that identifies hazards related to a particular job or task by breaking the job into steps. A JHA must be completed for all higher-risk tasks or jobs.

**Research:**

- [General Laboratory Risk Assessment](#) assesses risk for a unique lab research project and includes lab-specific risk identification tools. Required before starting a new project.
- [Field Work Risk Assessment](#) is required for all higher-risk field work.

**Equipment:**

- [Equipment Risk Assessment](#) can be used to identify and control hazards related to a particular piece of equipment.
- [Equipment Pre-purchase Checklist](#) can be used to identify hazard control needs during the planning phase of purchasing new equipment.

**Program-specific:**

- [Biosafety](#)
- [Laser safety](#)
- [Nanomaterials](#)

## 6.4 SAFE OPERATING PROCEDURE DEVELOPMENT

A safe operating procedure (SOP) is often required as an administrative risk control for hazards following assessment and implementation of higher-order controls, for example machine guarding.

SOPs are required where the risk level remains above a “Low” level on the Hazard Register or other risk assessment tool, and where following a specific set of steps will reduce risk of injury. Guidance on developing SOPs is available from the Safety Office and examples of completed SOPs are available in the [SOP Repository](#).

## 7.0 TRAINING

All supervisors and department heads/chairs/directors must be competent in assessing and controlling risks associated with the work under their control. To assist with achieving competency, the Safety Office provides online and classroom training sessions. Refer to the Risk Assessment Program webpage for a list of training.

## **8.0 MONITORING AND REVIEW**

### **8.1 EVALUATING FOR NEW HAZARDS AND INEFFECTIVE CONTROLS**

Once a planned and systematic system is in place to manage hazards and associated risk, continuous monitoring is required to detect new hazards and highlight any ineffective controls. If an issue is found, corrective action should be taken to fix the problem. If the action will take more than a few weeks to complete, it should be recorded and progress monitored through to completion.

Monitoring and updating of risk assessments should occur when:

- Reporting and investigating hazards and incidents, or workplace inspections identify a new or uncontrolled risk.
- Annual audits under Biosafety, Radiation and Laser Safety programs take place.
- A new hazard is introduced into the workplace or an existing hazard eliminated.
- Changes occur to the workplace or the way work is organized that may introduce new hazards.
- Workers/research students, a health and safety coordinator, or Joint Health & Safety Committee member request a review of a risk.
- A control measure does not appear to be effective.
- The understanding of certain hazards changes, provoking a need to review the applicability of previous risk assessments and risk controls.
- New or changed procedural or regulatory requirements are introduced for the management of certain risks.
- A trend analysis of incidents identifies a need.

### **8.2 MONITORING CONDUCTED UNDER THE HEALTH, SAFETY & ENVIRONMENT MANAGEMENT SYSTEM (HSEMS)**

Department heads, as part of the HSEMS, shall:

- Maintain an up-to-date Hazard Register and conduct a documented annual review to be submitted to the Safety Office as part of the Department Annual Health, Safety & Environment Report.
- Establish management processes to ensure that site risk assessments are completed by supervisors under their authority. This includes ensuring that all supervisors are familiar with the Hazard Register and can verify compliance with the controls documented within it.

### **8.3 MANAGEMENT REVIEW**

Senior administrators will receive a report reflecting conformance to this program annually.

## 9.0 RECORD KEEPING AND DOCUMENTATION

Department heads must maintain an up-to-date Hazard Register. Supervisors must maintain records of local risk assessments pertaining to specific hazards under their control. The Safety Office will maintain a copy of each Hazard Register, initially and as updated annually.

## 10.0 REFERENCES

CAN/CSA-Z1002-12 (R2017) - Occupational health and safety - Hazard identification and elimination and risk assessment and control. CSA Group.

University of South Australia (2016). Managing Workplace Health & Safety Risks. Retrieved from [unisa.edu.au/ohsw](http://unisa.edu.au/ohsw).

## 11.0 RECORD OF REVISIONS

Date of Review	Author/Editor	Change	Version
January 2023	Kate Windsor	<ul style="list-style-type: none"><li>Section 4.3 – Added “Establish Safe Operating Procedures (SOP’s) for high-risk tasks and equipment. Workers/students must be trained on SOP’s specific to their assigned work tasks</li><li>Section 8.3 Management review - title change</li><li>Housekeeping updates</li><li>Section 11.0 – Record of Revisions added</li></ul>	Risk Assessment Program v.1.1 JAN 2023
April 2022	Kate Windsor	<ul style="list-style-type: none"><li>No changes</li></ul>	Risk Assessment Program v.1.0_JUNE 2019
June 2019	Kate Windsor	<ul style="list-style-type: none"><li>New Program released</li></ul>	Risk Assessment Program v.1.0_JUNE 2019