RISK ASSESSMENT PROGRAM

Contents

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 EXECUTIVE MANAGEMENT

- 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 MANAGEMENT

- 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 workers are aware of the Hazard Register and the risk control measures of these hazards during onboarding safety orientation.
- 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 (FACULTY MEMBERS AND SUPERVISORY STAFF)

- 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 EMPLOYEES AND OTHERS

- 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

- Identify the hazards and make recommendations during the JHSC inspections.
- Verify that each department maintains an up-to-date Hazard Register during JHSC workplace inspections.
- Review this program every three years.

4.7 DEPARTMENTAL HEALTH AND SAFETY COORDINATORS

- Assist the department management with the implementation of this program.
- Facilitate the annual review and update of the Hazard Register.

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 Heath, 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.
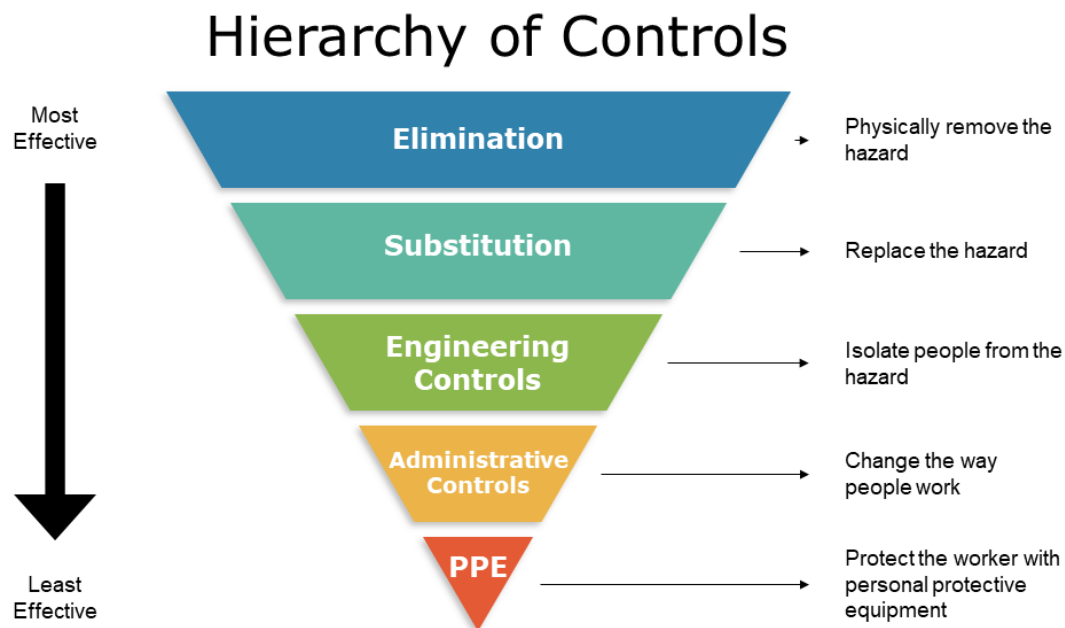

Figure 2: Hierarchy of Controls

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 management 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 management 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 management 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 reviewed annually in consultation with workers.

The University Safety Office provides a 4×4 risk assessment matrix for conducting risk analyses, and the procedure for using it is outlined in the Hazard Register Manual Link.

Table 1: Risk Matrix

LIKELIHOOD OF INJURY	RISK SEVERITY/CONSEQUENCE			
	CRITICAL *(severe injury or fatality - >2 weeks lost time, major property damage)*	**MAJOR** *(injury resulting in at least one day lost time, moderate property damage)*	**MINOR** *(medical aid only, minor property damage)*	**NEGLIGIBLE** *(first aid treatment, minimal threat)*
VERY LIKELY *(likely to occur in a short period of time, expected to occur frequently)*	High	High	Medium	Medium
LIKELY *(quite likely to occur in time)*	High	Medium	Medium	Low
UNLIKELY *(not likely to occur, but possible)*	Medium	Medium	Low	Very low
VERY UNLIKELY *(Not likely to occur, even over time)*	Medium	Low	Very low	Very low

The risk evaluation may be rated as very low, low, medium, or high, each requiring specific actions and an associated timeline for implementing the corrective action plan.

Table 2: Risk Priority Table

Risk priority	Definitions of priority	Time frame
High	Situation critical, stop work immediately or consider cessation of work process. Must be fixed today, consider short term and/or long term actions.	**Now**
Medium	Is very important, must be fixed urgently, consider short term and/or long term actions.	**1 – 3 weeks**
Low	Is still important but can be dealt with through scheduled maintenance or similar type programming. However, if solution is quick and easy then fix it today.	**1 - 3 Months**
Very low	Review and/or manage by routine processes	**Not applicable**

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 Management Form and JHA are required for all field work categorized as having 'significant risk' under the Field Work Risk Management Program.

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 management 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. All supervisory staff are required to complete the Risk Assessment (SO2500), and those working in higher-risk areas are strongly encouraged to complete the Risk Assessment Application (SO2501).

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

The University Executive Management will receive a report reflecting conformance to this program annually.

9.0 RECORD KEEPING AND DOCUMENTATION

Department management shall 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 retain a copy of each Hazard Register, initially and as updated annually in accordance with the [University Retention Policy](#).

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.

11.0 RECORD OF REVISIONS

Date of Review	Author/Editor	Change	Version
January 2026	Ola Olayinka	• Sections 4.1, 4.2, 4.3, 6.2, 7.0, 9.0 – Department Management and Executive Management - Title change to align with the University HSEMS. • Section 4.2 - Ensure workers are aware of the Hazard Register and the risk control measures of these hazards. • Section 4.6 - Check if Departments have an up-to-date Hazard Register during the JHSC workplace inspections. • Section 4.6 – Review this program every three years. • Section 4.7 - Assist the department management with the implementation of this program. • Section 6.2 – Change department heads/directors/chairs to department management in alignment with the HSEMS. • Section 6.2 - Day-to-day hazards, which are easily fixed as a matter of course, would not normally be entered into the Hazard Register. • Section 6.2 - The Hazard Register should be reviewed annually in consultation with workers. • Section 6.2 - The University Safety Office provides a 4×4 risk assessment matrix for conducting risk analyses, and the procedure for using it is outlined in the Hazard Register Manual. The risk evaluation may be rated as very low, low, medium, or high, each requiring specific actions and an associated timeline for implementing the corrective action plan. Inserted the 2 pictures (Figures 3 and 4). • Section 7.0 - All supervisory staff are required to complete the Risk Assessment (SO2500), and those working in higher-risk areas are strongly encouraged to complete the Risk Assessment Application (SO2501). • Section 9.0 - The Safety Office will retain a copy of each Hazard Register, initially and as updated annually in accordance with the University Retention Policy.	Risk Assessment Program v.1.2 JAN2026
January 2023	Kate Windsor	• 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 • Section 8.3 Management review - title change • Housekeeping updates • Section 11.0 – Record of Revisions added	Risk Assessment Program v.1.1 JAN 2023
April 2022	Kate Windsor	• No changes	Risk Assessment Program v.1.0 JUNE 2019
June 2019	Kate Windsor	• New Program released	Risk Assessment Program v.1.0 JUNE 2019