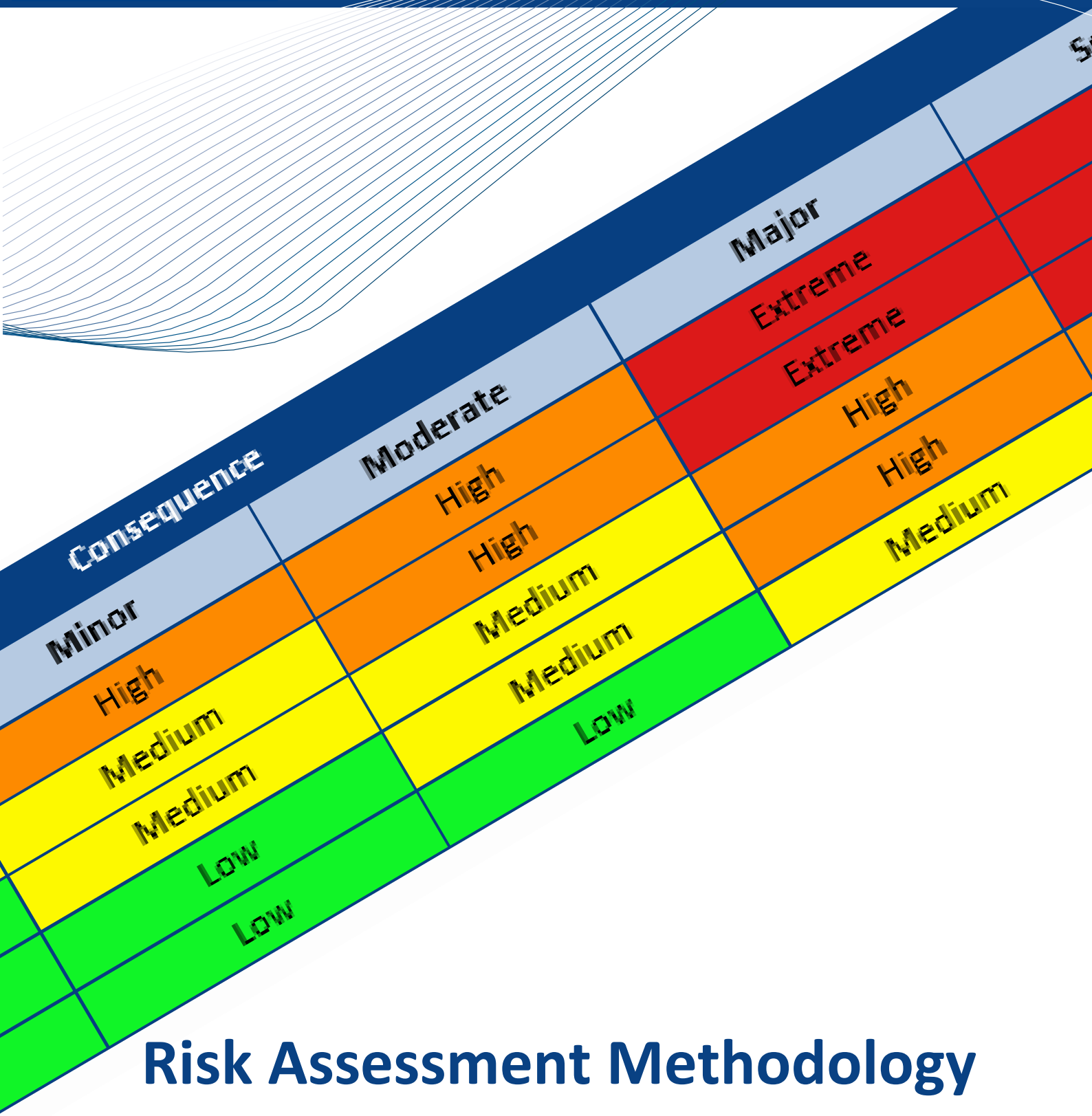
THE UNIVERSITY OF MELBOURNE



Risk Assessment Methodology

This document has been developed to support The University of Melbourne's risk assessment methodology and the Health & Safety: Risk management requirements.

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1 INTRODUCTION

This document describes the methodology for completing risk assessments, using the University of Melbourne's risk assessment systems and processes. It explains both the current software application and the hard copy application.

1.1 Software application

Risk assessments are entered and stored into the Enterprise Risk Management System (ERMS). A University username and password is required to access ERMS via the Staff Hub or directly from web site: Enterprise Risk Management System.

1.2 Hard copy application

Hard copy risk assessment forms are available where access to ERMS is not available. These can later be transposed to ERMS. These are detailed in Section 6.

1.3 Considerations

Health and safety risk assessments must consider the likelihood and consequence of injury, illness or incident occurring, based upon:

- relevant legal requirements;
- evaluation of available information;
- records of incidents, illness and disease; and
- potential for emergency situations.

2 RISK SCORING/ANALYSIS

2.1 Using the two variable risk matrix

University risk assessments use a **two variable risk matrix** for risk scoring/analysis. The two variable risk assessment is aligned in both the software application and the hard copy application.

The two variable risk matrix assesses the likelihood and consequence of a hazard. This assessment determines the level of risk associated with the hazard.

Likelihood is the probability that something might happen.

Consequence is defined as the most probable result of the potential incident.

NOTE:

Under some circumstances an alternative risk matrix or methodology may be used. For example the chemical risk assessment methodology in GoldFFX.

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Figure 1: Two variable risk matrix

This section explains how to use the two variable risk matrix.

Refer to Appendix A for likelihood and consequence definitions.

Step 1: Consider the likelihood of the exposure to the hazard occurring. Using the table "Likelihood", determine the likelihood of exposure to the hazard.

Step 2: Consider the consequence of exposure to the hazard. Using the table "Consequence", determine as realistically as possible the consequence resulting from exposure to the hazard.

Step 3: Using the two variable risk matrix, determine the risk rating from the likelihood and consequence descriptors. To use the risk rating matrix:

- In the column "Likelihood" of the risk matrix, locate the likelihood descriptor that was determined in the Step 1.
- In the row "Consequences" of the risk rating calculator, locate the consequence descriptor that was determined in Step 2.
- The risk rating is provided in the box where the likelihood column and consequence intersect.

The following demonstrates using two variable risk matrix to analyse the risk associated with an activity. Refer to table 2.

Step 1: The likelihood for an activity is determined as "unlikely"

Step 2: The consequence for an activity is determined as "moderate".

Step 3: The likelihood and consequence intersect at "medium". Therefore activity has an associated medium risk.

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Figure 2: Determining risk using the two variable risk matrix

2.2 Inherent risk and residual risk

The University risk assessment methodology requires an analysis/score for both the inherent risk and the residual risk.

The **inherent risk**, is the level of risk that an activity/hazard category would pose if ***no controls*** or other mitigating factors were in place.

The r**esidual risk** is the level of risk associated with an activity *after* proposed/additional controls have been implemented to further eliminate or reduce the risk.

Where proposed/additional controls are required the residual risk should be lower than the inherent risk. In some cases where the inherent risk may already be "low", the residual risk will be the same.

3 RISK CONTROL MEASURES

Following the risk analysis, the risk assessment then determines the most effective control method to eliminate or reduce the risk so far as is reasonably practicable. The **hierarchy of control** (see Section 5) is used to determine this method for eliminating or reducing the risk.

The implementation of control priorities can be established based on the level of risk, available resources, timelines associated with the implementation of controls and so on. Where risk control prioritisation is required a plan must be developed (Section 4).

Control measures must be implemented in accordance with the risk control priorities established during the risk assessment.

Control measures should include one or more of the following actions:

- eliminate or control the risk by applying an established control from an existing risk assessment;
- partially control the risk (including isolation) and refer to a more senior manager;
- request advice from a Health and Safety Business Partner; and/or
- refer to the local Health & Safety Committee for further assessment.

4 HIERARCHY OF CONTROL

The Hierarchy of Control describes the ranking of methods for controlling risks from the highest level of protection and reliability to the lowest.

The level/method of control should be appropriate to the level of risk. A severe risk activity, if it cannot be eliminated, would require higher levels of controls than a low risk activity. For example engineering controls, such as interlocks, are used to ensure a centrifuge cannot be opened whilst in operation. Personal protective equipment, such as gloves, are used when changing a printer cartridge.

Often risks are controlled using a combination controls.

The hierarchy of control is listed on the next page in order of effectiveness.

Level 1 (highest effectiveness)

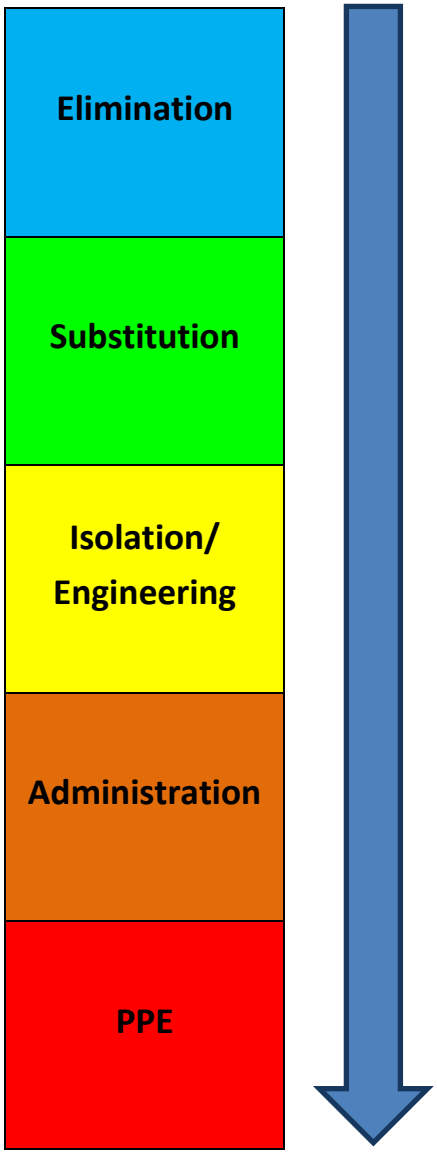
Elimination Remove the hazard. e.g. eliminating a requirement to carry out the task, use a piece of equipment or utilise a chemical.

Level 2

Substitution Substitute the hazard for something safer. For instance, replace solvent-based paints with water-based ones. Replace the material, plant or work practice with a less hazardous one – such as replacing a hazardous chemical with a less hazardous one.

Isolation Isolate the hazard from people. This involves physically separating the source of harm from people by distance or using barriers. For instance, install guard rails around exposed edges and holes in floors, use remote control systems to operate machinery, or store chemicals in a fume cabinet.

Engineering Change the workplace, equipment or work process. For instance, use mechanical devices such as trolleys or hoists to move heavy loads, place guards around moving parts of machinery, install residual current devices (electrical safety switches), or set work rates on a production line to reduce fatigue.



Level 3 (lowest effectiveness)

Administration Use administrative controls. For instance, develop procedures on how to operate machinery safely, limit exposure time to a hazardous task by job rotation, carry out preventative maintenance on machinery and equipment, provide training and instruction on safe handling for a manual task or use signs to warn people of a hazard.

PPE Use personal protective equipment (PPE). This also includes protective clothing. Examples of PPE include breathing protection, hard hats, gloves, aprons and protective eyewear. PPE limits exposure to the harmful effects of a hazard but only if workers wear and use the PPE correctly.

Date: May 2018 **Version**: 2.2 **Authorised by**: Manager, Health & Safety, Operations **Next Review**: May 2023

5 HEALTH AND SAFETY ACTION PLANS

Proposed/required control measures must be prioritised, planned and recorded. These can be entered directly into ERMS or on a hard copy Health & Safety: Action plan. Plans should take into account:

- hazards identified
- risks associated with the hazards identified
- existing risk controls
- proposed short-term controls (including proposed completion dates)
- proposed medium-term controls (including proposed completion dates)
- proposed long-term controls (including proposed completion dates)
- person(s) responsible for implementing the controls
- resources required for implementing the controls
- proposed review date

Refer to Appendix A which specifies the University of Melbourne's methodology for prioritising risk and determining appropriate actions including:

- risk acceptance – for example "extreme" risk is not acceptable
- risk actions – for example "extreme" risk requires ceasing or isolating the source of the risk
- time frames – for example "extreme" risk requires immediate action

5.1 ERMS health and safety action plans

The ERMS application has a health and safety action plan included in the risk assessment. Any proposed/additional controls can be prioritised by allocating a date for close out/completion. For example the date of completion for a medium risk may be sooner than a date for a low risk.

Additionally the control plan allocates a responsible person and progress of implementation can be included.

5.2 Hard copy health and safety action plans

Hard copy health and safety action plans are available where access to ERMS is not available. These can later be transposed to ERMS.

Health & Safety: Action plan

Date: May 2018 **Version**: 2.2 **Authorised by**: Manager, Health & Safety, Operations **Next Review**: May 2023

6 HAZARD SPECIFIC AND GENERAL RISK ASSESSMENTS

6.1 ERMS

Both hazard-specific and general risk assessments can be created in ERMS. The risk assessments can incorporate:

- one hazard category per risk assessment
  - for example a plant risk assessment
- multiple hazard categories per risk assessment
  - for example a risk assessment that incorporates plant, chemicals and manual handling

CHOOSING A RISK ASSESSMENT FORM:

A hazard-specific risk assessment is suited to activities/tasks that predominately consist of one hazard category. For example sorting and shelving books comprises of mainly manual handling exposures. Therefore a manual handling risk assessment would suit the assessment of this activity.

A general risk assessment is suited to Activities/tasks that include a number of hazard categories, where none appear to predominate. For example injecting a horse with technetium-99m for diagnostic purposes. In this activity there are hazard exposures associated with chemicals, radioactive materials, manual handling live animals, biological substances and so on.

Additionally in the above example a separate hazard-specific risk assessment could be completed for each hazard category. However the nature of hazards/risks can alter or require different prioritisation when assessed together. This means you may not achieve the best outcome from assessing these hazards in isolation.

6.2 Hazard-specific risk assessment forms

Hard copy hazard-specific risk assessment forms have been created to provide guidance for assessing many common hazard categories. These forms provide detailed prompts about the hazards typically encountered during a specific activity.

Examples of hazard-specific risk assessment forms available include:

- Chemical risk assessment form
- Confined space identification and risk assessment form
- Field work risk assessment form
- First aid risk assessment form
- Hazardous manual handling risk assessment form
- Noise hazard identification form
- Computer workstation ergonomic self-assessment checklist
- Home-based workstation assessment checklist
- Laboratory note book
- Plant risk assessment form
- Radioactive material risk assessment form
- Health & Safety pre-purchase checklist
- Traffic management risk assessment
- Travel to high risk destinations risk assessment form
- Non-UniTravel risk assessment form

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The most recent forms are located on the Safety website at:

http://safety.unimelb.edu.au/management/implement

6.3 General risk assessment forms

Risk assessment forms that can be used for activities without an associated hazard-specific assessment (general risk assessments) include:

- Task risk assessment form (TRA)
- General risk assessment form

The most recent forms are located on the Safety website at:

- http://safety.unimelb.edu.au/management/implement

6.4 Manufacture of plant and equipment, including regulated plant

Before manufacturing plant, equipment or regulated plant, the staff involved must ensure that a design risk assessment has been completed. The risk assessment should be completed in consultation with a health and safety representative (HSR) and employees where reasonably practicable. The risk assessment must consider:

- the need for a functional risk assessment
- installation
- decommissioning
- storage
- breakdown maintenance
- preventive maintenance and inspection
- competencies, qualifications and training for users/operators
- availability, suitability and quality of operating procedures
- cleaning
- electrical hazards and compliance
- legislative requirements (including registration and licenses)
- conformance with relevant standards

6.5 High consequence operations

Permit-to-work procedures are incorporated into certain University-wide health and safety procedures governing high consequence operations. These include:

- hot work; and
- confined space entry.

When establishing potentially high consequence operations in a local area, the person responsible for the activity should consider permit-to-work procedures as a risk control measure. HSRs and employees should be consulted about risk control measures where reasonably practicable.

Examples of potentially high consequence operations include:

- working at heights
- diving
- remote field work

6.6 Design of new buildings or structures, and building refurbishments

During the design of new buildings, structures or building refurbishments, the Director, Project Services or Director Infrastructure Services (or other person responsible for the requisition of the project) shall ensure that the designer undertakes a risk assessment for all proposed work environments in the building or structure.

The risk assessment should seek to ensure that the building or structure is designed to be safe and without risks to the health of persons using the building or structure as a workplace. The risk assessment must consider:

- requirements of the University's Project Management and Design Standards
- requirements of the Building Code of Australia, including fire protection, emergency exits and lighting, workplace facilities, and access and egress
- requirements of AS/NZS 3000: Electrical installations, for electrical safety, including building wiring and switchboards
- requirements of the *Environment Protection Act 1970* (Vic), including trade waste and underground storage tanks
- requirements of the *Public Health and Wellbeing Act 2008* (Vic) and *Public Health and Wellbeing* Regulations *2009* (Vic), regarding air conditioning cooling towers
- site of buildings or structures
- high consequence hazards
- systems of work
- workplace environment (for example, lighting, ventilation, workplace facilities)
- incident mitigation
- access and egress to roof and other work areas where there is a risk of falling more than two metres

Before commencement of the refurbishment or construction, the Director Project Services or Director Infrastructure Services (or other person responsible for the project) must ensure that the designer provides evidence of having developed, documented and budgeted for suitable controls for the risks identified in the risk assessment.

6.7 Acquisition and leasing of buildings and operational entities

Persons responsible for acquisition or leasing of buildings, or acquisition of operational entities, must ensure that a risk assessment for all proposed new and altered work environments is completed before the acquisition or lease commences.

The following matters may need to be considered in the risk assessment:

- plant or equipment (including lifts, compressors and air conditioning units), unless a risk assessment already exists for the plant or equipment
- requirements of the Building Code of Australia (for example, fire protection, emergency exits and lighting, workplace facilities, access and egress)
- structural integrity
- fixtures and fittings
- requirements of AS/NZS 3000: Electrical installations, for electrical safety, including building wiring and switchboards
- hazardous materials registers, including asbestos, polychlorinated biphenyls (PCBs) and synthetic mineral fibres (SMF)
- requirements of the *Environment Protection Act 1970* (Vic), including trade waste and underground storage tanks
- requirements of the *Public Health and Wellbeing Act 2008* (Vic) and *Public Health and Wellbeing Regulations 2009* (Vic), regarding air conditioning cooling towers
- hazardous substances stored and used (including refrigeration systems)
- dangerous goods stored and used
- confined spaces
- lighting
- workplace design and its impact on proposed systems of work
- access and egress to roof and other work areas where there is a risk of falling more than two metres

Before the acquisition or lease commences, the person responsible must ensure that suitable controls for the risks identified in the risk assessment have been developed, documented and budgeted for.

7 REFERENCES

Occupational Health and Safety Act 2004 (Vic)

Occupational Health and Safety Regulations 2017 (Vic)

AS/NZS 3000: Electrical installations

Building Code of Australia

SA/NZS ISO 31000: Risk management

SA/SNZ HB 436: Risk management guidelines - Companion to AS/NZS ISO 31000

Public Health and Wellbeing Act 2008 (Vic)

Public Health and Wellbeing Regulations 2009 (Vic)

University of Melbourne, Project Management and Design Standards

Health & Safety: Risk management requirements

APPENDIX A: HEALTH & SAFETY – RISK MATRIX AND DEFINITIONS

		Consequence				
		Insignificant	**Minor**	**Moderate**	**Major**	**Severe**
Likelihood	**Almost certain**	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Likelihood
Almost certain – will occur in most circumstances when the activity is undertaken (greater than 90% chance of occurring)
Likely - will probably occur in most circumstances when the activity is undertaken (51 to 90% chance of occurring)
Possible – might occur when the activity is undertaken (21 to 50% chance of occurring)
Unlikely – could happen at some time when the activity is undertaken (1 to 20% chance of occurring)
Rare – may happen only in exceptional circumstances when the activity is undertaken (less than 1% chance of occurring)

Consequence
Insignificant –First aid treatment, minor injury, no time off work
Minor – Single occurrence of medical treatment, minor injury, no time off work
Moderate – Multiple medical treatments, non-permanent injury, less than 10 days off work
Major – Extensive injuries requiring medical treatment (e.g. surgery), serious or permanent injury/illness, greater than 10 days off work
Severe – Severe injury/illness requiring life support, actual or potential fatality, greater than 250 days off work

Risk Rating Priority for Action			
	Risk acceptance guide	**Action**	**Recommended action time frame**
Extreme	Not acceptable	Cease or isolate source of risk Implement further risk controls Monitor, review and document controls	Immediate Up to 1 month Ongoing
High	Generally (in most circumstances) not acceptable	Implement risk controls if reasonably practicable Monitor, review and document controls	1 to 3 months Ongoing
Medium	Generally (in most circumstances) acceptable	Implement risk controls if reasonably practicable Monitor, review and document controls	3 to 6 months Ongoing
Low	Acceptable	Monitor and review	Ongoing