THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Health and Safety Risk Assessment

Activity / Task / Location:	Reviewed / Approved By: Lachlan Rogers
Michelson-Morley Experiment / Callaghan SB308-309; Ourimbah EXSA1.01/1.02	Signature and Date: Lachlan Rogers 20/03/2025
Risk Assessment Developed by: Galiya Sharafutdinova	**Date:** 16/05/2022

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Consequence

	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.

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Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**Risk Rating based on Risk Matrix**	**What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**Residual Risk Rating based on Risk Matrix**	**What hazard remains?**	**What additional actions are required (by who and in what timeframe) to raise the level of control?**
Using laboratory space	Trip hazard due to: • obstructions in walkways • wires trailing over bench edges May cause a serious injury, but unlikely to occur.	Mediu m	On lab session advise students to • keep bags under benches to avoid obstructions; • Keep the work area clean and tidy; • Ensure reasonable precautions not to let long wires dangle over bench edges and no loose cables near feet.	Low	Tripping, but unlikely to happen	Instruct students on the Lab Induction. Staff to observe

			May require first aid			
Use of a laser source	Eye damage due to laser radiation May require medical attention, but unlikely to happen.	Mediu m	A low class LED laser source (red, about 630 nm; visible) is rigidly fixed into a holder. Then the beam is expanding through a lens and projected to a screen. Setup will be ensured by a lab officer. Apparatus then is covered (black cloth, etc) so there is no direct access to the beam for students and staff. The human blink reflex provides adequate protection. Do not stare on a beam for a long time. Warning notice adjacent to equipment. Warning in notes On lab session advise students on the hazard	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe.
Heave equipment: Michelson-Morley	If dropped on floor could cause a physical injury. May require medical attention, Only demonstrators/tec h personal to handle the apparatus	Low	Locate the apparatus appropriately on a bench to eliminate accidental push and/or fall down	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe

Mechanical rotation stage	Keep hands clear of mechanical moving parts. .	Low	Instruct students to keep equipment in the middle of the bench	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using electrical equipment	Exposure to dangerous voltages from faulty equipment May cause death or serious injury, but very unlikely to happen.	High	Regular checking and tagging of mains powered equipment, including power supply and lamp, for frayed cords and poor earth continuity to case of equipment. Check all power cords for visible deterioration prior to each use.	Medium		Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Personal protective equipment such as lab coats or glasses are not required						

Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Not Applicable	Annually
Other Equipment and Equipment Protection	Equipment for the experiment: Michelson interferometer	Annually
Training Requirements	No special training required for students	Annually
Procedures, SOPs etc	All instructions are provided in the document called Experiment Fest booklet	Annually
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

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Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as:

- Noise
- Light
- Radiation
- Toxicity
- Infection
- High or low temperatures
- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

- Are there heavy or awkward lifting jobs?
- Can people work in a comfortable posture?
- If the work is repetitive, can people take breaks?
- Are people properly trained?
- Do people follow correct work practices?
- Are there adequate facilities for the work being performed?
- Are universal safety precautions for biohazards followed?
- Is there poor housekeeping? Look out for clutter
- Torn or slippery flooring
- Sharp objects sticking out
- Obstacles

C Imagine that a child was to enter your work area?

- What would you warn them to be extra careful of?
- What would do to reduce the harm to them?

D What could go wrong?

- What if equipment is misused?
- What might people do that they shouldn't
- How could someone be killed?
- How could people be injured?
- What may make people ill?
- Are there any special emergency procedures required?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones
- Eye damage
- Hearing problems
- Strains or sprains
- Cuts or abrasions
- Bruises
- Burns
- Lung problems including inhalation injury/ infection
- Skin contact
- Poisoning
- Needle-stick injury
- Psychological illness or injury

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Health and Safety Risk Assessment

How to Assess Risk

Step 1 – Consider the Consequences

What are the potential consequences of an incident occurring?
Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

C. The calculated risk rating is where the two ratings cross

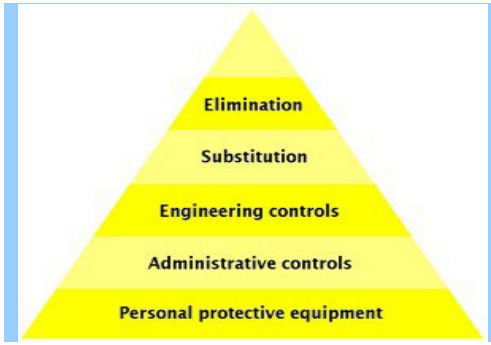
Consequence		Likelihood	
Serious	Potential Fatality or Injury or Illness with permanent disability	Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Major	Potential Lost Time Injury requiring time off work (but non-permanent disability)	Likel	The event has a reasonable chance of occurring in usual conditions: "It has happened here before".
Moderate	Potential medical treatment Injury or Illness but no lost time	Possible	The event might occur occasionally, has occurred sometime: "Has infrequently happened here before".
Minor	Potential First Aid Injury	Unlikely	The event has a small chance of occurring. "It has not happened here but has occurred elsewhere".
Minimal	No injury but hazard exists or near miss occurred requiring reporting and follow up action	Rare	Very unlikely to occur. "It would be extremely rare for it to occur here".

CONSEQUENCE	LIKELIHOOD				
	Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal	LOW	LOW	LOW	LOW	LOW

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as "extreme" or "high", steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the "hierarchy of controls". The Hierarchy of Controls are:

Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks



Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**

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Health and Safety Risk Assessment

Activity / Task / Location:	Reviewed / Approved By: Lachlan Rogers
Photoelectric Effect/ Callaghan SB308-309; Ourimbah EXSA1.01/1.02	Signature and Date: Lachlan Rogers 20/03/2025
Risk Assessment Developed by: Galiya Sharafutdinova	**Date:16/05/2022**

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Consequence

	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

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Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**Risk Rating based on Risk Matrix**	**What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**Residual Risk Rating based on Risk Matrix**	**What hazard remains?**	**What additional actions are required (by who and in what timeframe) to raise the level of control?**
Using laboratory space	Trip hazard due to: • obstructions in walkways • wires trailing over bench edges May cause a serious injury, but unlikely to occur.	Mediu m	On lab session advise students to • keep bags under benches to avoid obstructions; • Keep the work area clean and tidy; • Ensure reasonable precautions not to let long wires dangle over bench edges and no loose cables near feet.	Low	Tripping, but unlikely to happen	Instruct students on the Lab Induction. Staff to observe

			May require first aid			
Using the equipment: light source	Burns from hot surfaces on lamp housing. May require medical attention, but unlikely to happen.	High	Warning notice adjacent to equipment. Warning in notes On lab session advise students on the hazard	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using the equipment: plastic filters	Burns from melting plastic in coloured filters May require first aid, but unlikely to happen.	High	Instruct students to position filters in correct housing slot.	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using the equipment	If dropped could result in broken glass. Cut Injury from broken glass May require medical attention, Only tech personal to handle the lamp replacement.	Medium	Instruct students to keep equipment in the middle of the bench	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using electrical equipment	Exposure to dangerous voltages from faulty equipment May cause death or serious injury,	High	Regular checking and tagging of mains powered equipment, including power supply and lamp, for frayed cords and poor earth continuity to case of	Medium		Instruct students on the Lab Induction and prior to using the equipment. Staff to observe

	but very unlikely to happen.		equipment. Check all power cords for visible deterioration prior to each use.			
Personal protective equipment such as a lab coats or glasses are not required						

Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Not Applicable	Annually
Other Equipment and Equipment Protection	Equipment for the experiment: Photoelectric apparatus and coloured filters	Annually
Training Requirements	No special training required for students	Annually
Procedures, SOPs etc	All instructions are provided in the document named Experiment Fest booklet: Physics Handbook or similar.	Annually
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as: • Noise • Light • Radiation • Toxicity • Infection • High or low temperatures	**D What could go wrong**? • What if equipment is misused? • What might people do that they shouldn't • How could someone be killed? • How could people be injured? • What may make people ill? • Are there any special emergency procedures required?

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Health and Safety Risk Assessment

- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

- Are there heavy or awkward lifting jobs?
- Can people work in a comfortable posture?
- If the work is repetitive, can people take breaks?
- Are people properly trained?
- Do people follow correct work practices?
- Are there adequate facilities for the work being performed?
- Are universal safety precautions for biohazards followed?
- Is there poor housekeeping? Look out for clutter
- Torn or slippery flooring
- Sharp objects sticking out
- Obstacles

C Imagine that a child was to enter your work area?

- What would you warn them to be extra careful of?
- What would do to reduce the harm to them?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones
- Eye damage
- Hearing problems
- Strains or sprains
- Cuts or abrasions
- Bruises
- Burns
- Lung problems including inhalation injury/ infection
- Skin contact
- Poisoning
- Needle-stick injury
- Psychological illness or injury

How to Assess Risk

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Health and Safety Risk Assessment

Step 1 – Consider the Consequences

What are the potential consequences of an incident occurring?
Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Consequence	
Serious	Potential Fatality or Injury or Illness with permanent disability
Major	Potential Lost Time Injury requiring time off work (but non-permanent disability)
Moderate	Potential medical treatment Injury or Illness but no lost time
Minor	Potential First Aid Injury
Minimal	No injury but hazard exists or near miss occurred requiring reporting and follow up action

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Likelihood	
Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Likel	The event has a reasonable chance of occurring in usual conditions: "It has happened here before".
Possible	The event might occur occasionally, has occurred sometime: "Has infrequently happened here before".
Unlikely	The event has a small chance of occurring. "It has not happened here but has occurred elsewhere".
Rare	Very unlikely to occur. "It would be extremely rare for it to occur here".

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

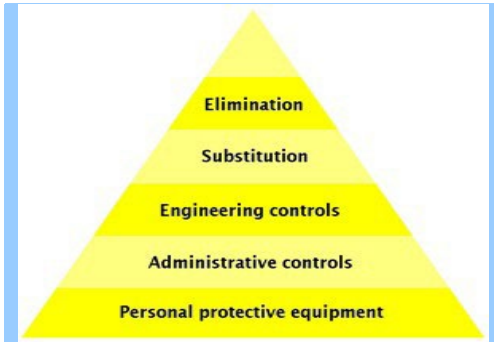
C. The calculated risk rating is where the two ratings cross

CONSEQUENCE	LIKELIHOOD: Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal	LOW	LOW	LOW	LOW	LOW

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as "extreme" or "high", steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the "hierarchy of controls". The Hierarchy of Controls are:

Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks



Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**

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Health and Safety Risk Assessment

Activity / Task / Location:	Reviewed / Approved By: Lachlan Rogers
Projectile Motion/ Callaghan SB308-309; Ourimbah EXSA1.01/1.02	Signature and Date: Lachlan Rogers 20/03/2025
Risk Assessment Developed by: Galiya Sharafutdinova	**Date:16/05/2022**

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Consequence

	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

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Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**Risk Rating based on Risk Matrix**	**What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**Residual Risk Rating based on Risk Matrix**	**What hazard remains?**	**What additional actions are required (by who and in what timeframe) to raise the level of control?**
Using laboratory space	Trip hazard due to: • obstructions in walkways • wires trailing over bench edges May cause a injury, but unlikely to occur.	Mediu m	On lab session advise students to • keep bags under benches; • Keep the work area clean and tidy; • Ensure reasonable precautions not to let long wires dangle over bench edges and no loose cables near feet. • Do not move around the lab unnecessarily	Low	Tripping, but unlikely to happen	Instruct students on the Lab Induction. Staff to observe

			during the experiment. May require first aid			
Using the equipment	Finger injury from fingers being caught in ball launcher May require first aid; but unlikely to happen.	Medium	Use plastic key to operate ball launcher. Keep fingers clear of ball launcher mechanism. Warning in notes On lab session advise students on the hazard	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using the equipment:	Eye injury from launching ball. May require first aid	High	Instruct students to • Wear safety glasses • Do not place face in front of the ball launcher.	Medium	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using the equipment	Injury from retort and stand falling onto bench or floor. May require medical attention,	Medium	Keep stand away from bench edge and ensure stand is sitting in a stable manner. Use covered footwear.	Low		Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Personal protective equipment required: protective safety glasses						

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Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Protective safety glasses	Annually
Other Equipment and Equipment Protection	Equipment for the experiment: launcher, ball, coconut target, retort and ruler	Annually
Training Requirements	No special training required for students	Annually
Procedures, SOPs etc	All instructions are provided in the document called Experiment Fest booklet	Annually
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as:

- Noise
- Light
- Radiation
- Toxicity
- Infection
- High or low temperatures
- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

- Are there heavy or awkward lifting jobs?

D What could go wrong?

- What if equipment is misused?
- What might people do that they shouldn't
- How could someone be killed?
- How could people be injured?
- What may make people ill?
- Are there any special emergency procedures required?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones

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Health and Safety Risk Assessment

• Can people work in a comfortable posture? • If the work is repetitive, can people take breaks? • Are people properly trained? • Do people follow correct work practices? • Are there adequate facilities for the work being performed? • Are universal safety precautions for biohazards followed? • Is there poor housekeeping? Look out for clutter • Torn or slippery flooring • Sharp objects sticking out • Obstacles	• Eye damage • Hearing problems • Strains or sprains • Cuts or abrasions • Bruises • Burns • Lung problems including inhalation injury/ infection • Skin contact • Poisoning • Needle-stick injury • Psychological illness or injury
C Imagine that a child was to enter your work area? • What would you warn them to be extra careful of? • What would do to reduce the harm to them?	

How to Assess Risk

Step 1 – Consider the Consequences

What are the potential consequences of an incident occurring?

Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Consequence	
Serious	Potential Fatality or Injury or Illness with permanent disability
Major	Minimal
Moderate	
Minor	

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Likelihood	
Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Likel	Potential Lost Time Injury requiring time off work (but non-permanent disability)
Possible Unlikely	Potential medical treatment Injury or Illness but no lost time
Rare	Potential First Aid Injury

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

C. The calculated risk rating is where the two ratings cross

	LIKELIHOOD				
	Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
No injury but hazard exists or near miss occurred requiring	repo rting and follo w up actio n	The event has a reaso nable chanc e of occur	ring in usual condit ions: "It has happ ened	here befor e". The event might occur occasio	nally, has occurred sometime: "Has infrequently happened here before". The event has

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks

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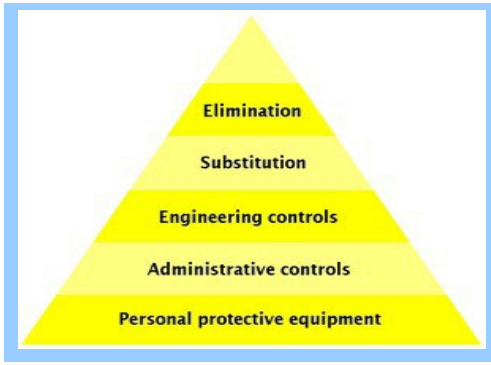
a small chance of occurring. "It has not happened here but has occurred elsewhere".	Major	LOW	LOW	LOW	MEDIUM	MEDI	HIGH	EXT
	Moderate	LOW			LOW	UM	MEDIUM	RE
	Minor	Minimal			LOW	MEDI	MEDIUM	ME
Very unlikely to occur. "It would be extremely rare for it to occur here".					LOW	UM	LOW	HIG
						LOW		H
						LOW		ME
								DIU
								M
								LOW

Health and Safety Risk Assessment

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as “extreme” or “high”, steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the “hierarchy of controls”. The Hierarchy of Controls are:



Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.
Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**

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Health and Safety Risk Assessment

Activity / Task / Location: Properties of Light (Speed of light and Young's double slit) / Callaghan SB308-309; Ourimbah EXSA1.01/1.02	Reviewed / Approved By: Lachlan Rogers Signature and Date: Lachlan Rogers 20/03/2025
Risk Assessment Developed by: Galiya Sharafutdinova	Date:16/05/2022

Risk Matrix

Likelihood

Consequence	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Actions required based on Risk Assessment

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Health and Safety Risk Assessment

Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**Risk Rating based on Risk Matrix**	**What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**Residual Risk Rating based on Risk Matrix**	**What hazard remains?**	**What additional actions are required (by who and in what timeframe) to raise the level of control?**
Using laboratory space	Trip hazard due to: • obstructions in walkways • wires trailing over bench edges May cause a injury, but unlikely to occur.	Mediu m	On lab session advise students to • keep bags under benches; • Keep the work area clean and tidy; • Ensure reasonable precautions not to let long wires dangle over bench edges and no loose cables near feet. • Do not move around the lab unnecessarily	Low	Tripping, but unlikely to happen	Instruct students on the Lab Induction. Staff to observe

			during the experiment. May require first aid			
Using the equipment: light source	Access to a laser beam (red). The laser is located inside the Perspex box. There is no emitting aperture from the Perspex box.	Mediu m	All sides of the enclosure are covered to protect viewing bright reflection spots. For the switch on/off procedure, demonstrator to remove jewellery and other high reflective surfaces to avoid beam reflection. On lab session advise students on the hazard	Low	unlikely to happen	Tech staff and demonstrators to observe procedure and Instruct students on the Lab Induction and prior on safety for using light source.
Using electrical equipment	Exposure to dangerous voltages from faulty equipment May cause death or serious injury, but very unlikely to happen.	High	Regular checking and tagging of mains powered equipment, including power supply and lamp, for frayed cords and poor earth continuity to case of equipment. Check all power cords for visible deterioration prior to each use.	Medium		Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Personal protective equipment such as a lab coats or glasses are not required						

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Health and Safety Risk Assessment

Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Not Applicable	Annually
Other Equipment and Equipment Protection	Equipment for the experiment: none	Annually
Training Requirements	No special training required for students	Annually
Procedures, SOPs etc	All instructions are provided in a document named Experiment Fest booklet: Physics Handbook or similar.	Annually
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as:

- Noise
- Light
- Radiation
- Toxicity
- Infection
- High or low temperatures
- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

- Are there heavy or awkward lifting jobs?

D What could go wrong?

- What if equipment is misused?
- What might people do that they shouldn't
- How could someone be killed?
- How could people be injured?
- What may make people ill?
- Are there any special emergency procedures required?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones

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Health and Safety Risk Assessment

• Can people work in a comfortable posture? • If the work is repetitive, can people take breaks? • Are people properly trained? • Do people follow correct work practices? • Are there adequate facilities for the work being performed? • Are universal safety precautions for biohazards followed? • Is there poor housekeeping? Look out for clutter • Torn or slippery flooring • Sharp objects sticking out • Obstacles	• Eye damage • Hearing problems • Strains or sprains • Cuts or abrasions • Bruises • Burns • Lung problems including inhalation injury/ infection • Skin contact • Poisoning • Needle-stick injury • Psychological illness or injury
C Imagine that a child was to enter your work area? • What would you warn them to be extra careful of? • What would do to reduce the harm to them?	

How to Assess Risk

Step 1 – Consider the Consequences

What are the potential consequences of an incident occurring?

Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Consequence	
Serious	Potential Fatality or Injury or Illness with permanent disability
Major	Minimal
Moderate	
Minor	

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Likelihood	
Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Likel	Potential Lost Time Injury requiring time off work (but non-permanent disability)
Possible	Potential medical treatment Injury or Illness but no lost time
Unlikely	Potential First Aid Injury
Rare	

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

C. The calculated risk rating is where the two ratings cross

	LIKELIHOOD				
	Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
No injury but hazard exists or near miss occurred requiring	repo rting and follo w up actio n	The event has a reaso nable chanc e of occur	ring in usual condit ions: "It has happ ened	here befor e". The event might occur occasio	nally, has occurred sometime: "Has infrequently happened here before". The event has

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks

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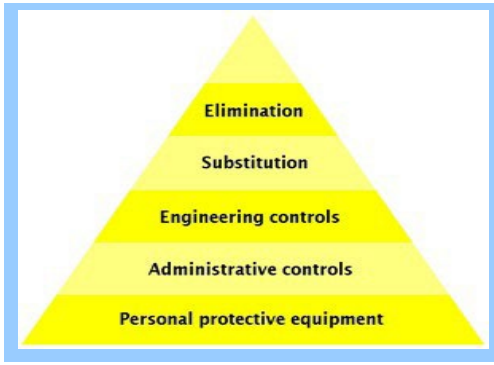
Health and Safety Risk Assessment

a small chance of occurring. "It has not happened here but has occurred elsewhere".	Major	LOW	LOW	LOW	MEDIUM	MEDI	HIGH	EXT
	Moderate	LOW			LOW	UM	MEDIUM	RE
	Minor	Minimal			LOW	MEDI	MEDIUM	ME
Very unlikely to occur. "It would be extremely rare for it to occur here".					LOW	UM	LOW	HIG
						LOW		H
						LOW		ME
								DIU
								M
								LOW

Health and Safety Risk Assessment

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as “extreme” or “high”, steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the “hierarchy of controls”. The Hierarchy of Controls are:



Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.
Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**

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Health and Safety Risk Assessment

V 1.3 - 1 May 2014

Activity / Task / Location: ExpFest:- Charge Particle, SB308/309	Reviewed / Approved By: Lachlan Rogers Signature and Date: Lachlan Rogers 20/03/2025
Developed by: Simon Utteridge	Date: 16 May 2022

Summary of Requirements

Personal Protective Equipment	Enclosed Footwear
Training	Standard Student Induction. Safety precautions listed in laboratory manual.
Equipment	None
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice
Review period/date	Annual

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM

Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**

[Text Box]

Actions required based on Risk Assessment

Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification		Control		Risk Assessment
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**What methods will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**What hazard remains?**	**What is the level of risk remaining based on the Risk Assessment matrix?**
Use of electrical equipment	Foot injury from test equipment and falling from bench.	Advise students to keep equipment away from bench edge. Ensure that all students have covered footwear.	May require medical attention, but unlikely.	**Low**
	Exposure to dangerous voltages from electrical	Ensure high voltage connections are correctly connected and covered.to stop the student touching the high voltage connections.	May require medical attention for electric shock, but unlikely.	**Medium**

	equipment.			
	Exposure to dangerous voltages from faulty equipment.	Regular checking and tagging of mains powered equipment, including computers, for frayed cords and poor earth continuity to case of equipment. Check all power cords for visible deterioration prior to each use.	May cause death or serious injury, but very unlikely.	**Medium**
	Trip hazard due to wires trailing over bench edges.	Warn students not to let long wires dangle over bench edges.	May require first aid, but unlikely to occur.	**Low**
	Trip hazard due to obstructions in walkways.	Advise students to keep bags under benches to avoid obstructions.	May require first aid, but unlikely to occur.	**Low**

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Health and Safety Risk Assessment

Activity / Task / Location:	Reviewed / Approved By: Lachlan Rogers
Hydrogen spectrum Experiment / Callaghan SB308-309; Ourimbah EXSA1.01/1.02	Signature and Date: Lachlan Rogers 20/03/2025
Risk Assessment Developed by: Galiya Sharafutdinova	**Date: 16/05/22**

Risk Matrix

Likelihood

Consequence	N.B. For more details regarding use of this matrix / definitions refer to final page of this document	Rare	Unlikely	Possible	Likely	Almost Certain
	Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
	Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
	Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
	Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

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Health and Safety Risk Assessment

Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	**What are the potential hazards?**	**Risk Rating based on Risk Matrix**	**What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?**	**Residual Risk Rating based on Risk Matrix**	**What hazard remains?**	**What additional actions are required (by who and in what timeframe) to raise the level of control?**
Using laboratory space	Trip hazard due to: • obstructions in walkways • wires trailing over bench edges May cause a serious injury, but unlikely to occur.	Mediu m	On lab session advise students to • keep bags under benches to avoid obstructions; • Keep the work area clean and tidy; • Ensure reasonable precautions not to let long wires dangle over bench edges and no loose cables near feet.	Low	Tripping, but unlikely to happen	Instruct students on the Lab Induction. Staff to observe

			May require first aid			
Use of hydrogen spectral lamps with associated equipment and computer.	Eye damage due to exposure to hydrogen spectral lamps	Low	Provide shielding so stray light from source is minimized. Warn students of the hazard in experiment notes and at start of experiment.	Low	unlikely to happen	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
	Spectral lamp falling over onto bench or floor, breaking glass in lamp.	Low	Position spectral lamps away from edge of bench to minimize possibility of falling on floor. Ensure lamps are mechanically stable. Advise students of the risk of knocking the lamp over.	Low	May require first aid, but unlikely to occur.	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Using electrical equipment	Exposure to dangerous voltages from faulty equipment May cause death or serious injury, but very unlikely to happen.	High	Regular checking and tagging of mains powered equipment, including power supply and lamp, for frayed cords and poor earth continuity to case of equipment. Check all power cords for visible deterioration prior to each use.	Medium	None.	Instruct students on the Lab Induction and prior to using the equipment. Staff to observe
Personal protective equipment such as a lab coats or glasses are not required						

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Health and Safety Risk Assessment

Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Not Applicable	Annually
Other Equipment and Equipment Protection	Equipment for the experiment: hydrogen lamp, viewing apparatus with vernier, PC	Annually
Training Requirements	No special training is required for students.	Annually
Procedures, SOPs etc	All instructions are provided in the document called Experiment Fest booklet:	Annually
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as:

- Noise
- Light
- Radiation
- Toxicity
- Infection
- High or low temperatures
- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

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- What if equipment is misused?
- What might people do that they shouldn't
- How could someone be killed?
- How could people be injured?
- What may make people ill?
- Are there any special emergency procedures required?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones

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Health and Safety Risk Assessment

• Can people work in a comfortable posture? • If the work is repetitive, can people take breaks? • Are people properly trained? • Do people follow correct work practices? • Are there adequate facilities for the work being performed? • Are universal safety precautions for biohazards followed? • Is there poor housekeeping? Look out for clutter • Torn or slippery flooring • Sharp objects sticking out • Obstacles	• Eye damage • Hearing problems • Strains or sprains • Cuts or abrasions • Bruises • Burns • Lung problems including inhalation injury/ infection • Skin contact • Poisoning • Needle-stick injury • Psychological illness or injury
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How to Assess Risk

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What are the potential consequences of an incident occurring?
Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Consequence	
Serious	Potential Fatality or Injury or Illness with permanent disability
Major	Potential Lost Time Injury requiring time off work (but non-permanent disability)
Moderate	Potential medical treatment Injury or Illness but no lost time
Minor	Potential First Aid Injury
Minimal	No injury but hazard exists or near miss occurred requiring reporting and follow up action

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Likelihood	
Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Likely	The event has a reasonable chance of occurring in usual conditions: "It has happened here before".
Possible	The event might occur occasionally, has occurred sometime: "Has infrequently happened here before".
Unlikely	The event has a small chance of occurring. "It has not happened here but has occurred elsewhere".
Rare	Very unlikely to occur. "It would be extremely rare for it to occur here".

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

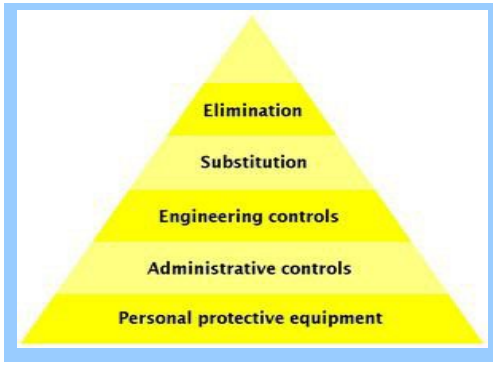
C. The calculated risk rating is where the two ratings cross

CONSEQUENCE	LIKELIHOOD: Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal	LOW	LOW	LOW	LOW	LOW

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks

Health and Safety Risk Assessment

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as “extreme” or “high”, steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the “hierarchy of controls”. The Hierarchy of Controls are:



Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.
Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**