



A hazard is any condition within the experimental protocol that has a potential to cause injury, illness or loss. Employees, supervisor and managers responsible for the work should conduct hazard assessment of any experiment involving hazardous materials, pressurized systems and scientific equipment. Also a hazard assessment should be engaged any time there is a potential for injury or loss, such as when working alone.

1. Identify existing and potential hazards:

- Review past incidents that have occurred with similar processes – resources: colleagues, internet, reference materials, regulations, standards
- Determine materials and equipment – based on ‘best practice’ and resource guidance, determine the optimal materials and equipment required
- Ask the question “What are potential negative outcomes associated with this activity?” and eliminate as many hazards as possible.
- Given that some materials, processes or equipment cannot be substituted or eliminated, evaluate the remaining hazards.

2. Evaluate the hazard (rated 1-5 in each category – see chart next page):

- **Exposure** -how often is any person exposed to the hazard or the experiment conducted?
- **Probability** - what is the probability of injury/loss?
- **Consequences** – how serious are potential negative outcomes?

Calculate the total numerical rating of the hazard and determine if the hazard rating is LOW, MEDIUM, or HIGH

3. Controlling the hazard (hierarchy: Engineering , Administrative and lastly, PPE):

Controls are actions taken to prevent injuries (see resources).

• **Engineering (eliminating the hazard):**

- | | |
|----------------------------------|--------------------|
| 1. Manufacturer's specifications | 3. Warning devices |
| 2. Laboratory Design factors | 4. Machine guards |

• **Administrative: (minimizing the hazard** - focused on the personnel)

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|--|--|
| 1. Supervision/ accountability process | 4. Ongoing safety inspections of apparatus are documented |
| 2. Rules (proactive vs. reactive) | 5. Safety as an agenda item i.e. updating co-workers at lab meetings |
| 3. Documented standards/policies | |

• **Personal Protective Equipment (PPE)**

1. PPE is the last resort to protect personnel and must be worn at all times in the hazard zone – i.e. lab coats, eye, ear, or foot protection

4. Communication:

1. Personnel must be informed of the hazards.
2. Personnel must be instructed using a formal communication mode on how to deal with the hazards identified.
3. If there is an injury it must be reported and investigated and controls must be put in place to reduce the likelihood of reoccurrence.

The hazard assessment must be documented and available to the personnel. All stakeholders should be involved in writing the hazard assessment

5. Competency:

1. monitor and measure implementation controls i.e. Supervisor must observe personnel conducting work activities to evaluate performance
2. Enforce implementation (document)
3. Enforce consequences/accountability



DESCRIPTION OF PROTOCOL: _____
 ASSESSMENT PERFORMED BY: _____
 DATE: _____

Items	Hazards Identified	Exposure (1-5)	Probability (1-5)	Consequences (1-5)	Total	Rating Low/Mod/Sev	Controls (ENG/ADMIN/PPE)	Completion Date	Initials
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									



#	Description of Hazard (Condition/circumstance)	Exposure (1-5)	Probability (1-5)	Consequences (1-5)	Total	Rating	Controls (ENG/ADMIN/PPE)
	Determine hazards associated with the experiment	How often is the person exposed to the hazard?	What is the probability of the occurrence?	What are the consequences?	Add the numbers for total risk		If the hazard cannot be eliminated, controls must be implemented to reduce the risk.
	Examples:	Rating	Rating	Rating	Total Risk	Rating	E - Engineering Admin- Administrative, PPE - Personal Protective Equipment
1		1 = > unlikely (1x a year or less)	1 = > unlikely to occur	1 = > insignificant (no damage)	3 - 5	Low - hazard requires monitoring Controls & safe work procedure recommended	<p>Engineering - assess the design of workplace automation/ material handling devices, machine guards, warning devices, fire suppression, interlocks, lockouts, isolation/enclosure, limitations, fume hood/ventilation, storage, air monitoring devices, spill control, spill cart, communication devices</p> <p>Administrative - substitution of a less toxic product, purchasing criteria (tools, equipment, chairs), policies/procedures, training, organizing/planning work, rotation of workers (limit hrs.), safety plan/ procedure (meetings), working alone procedures</p> <p>Personal Protective Equipment - eg. lab coat, goggles, glove type, hearing protection, appropriate footwear, etc</p>
2		2 = > occasionally (1x a month or less)	2 = > some chance of occurrence	2 = > first aid or minor property damage			
3		3 = > often (2- 4x per month)	3 = > could occur	3 = > lost time injury or significant property damage, seeks medical assistance	6 - 10	Moderate - hazard requires attention Controls & safe work procedure in place. All personnel must be aware of the hazards. Supervisor regularly evaluates the hazard.	
4		4 = > (1-2x per week)	4 = > good chance of occurring	4 = > injury results in permanent disability, serious health effects or structural property damage			
5		5 = > continuous (1x or more per day)	5 = > will occur if not attended to	5 = > Injury results in a fatality or major property damage	11 - 15		