

Guidance Notes on Health and Safety Risk Assessment

July 2017

Objective

- ▶ To provide information on the principles of risk assessment;
- ▶ To provide definitions of common terms of health and safety risk assessment;
- ▶ To illustrate with an example on how to fill in the CityU Health & Safety Risk Assessment for Workstations, Experiments and Research Projects.

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- ▶ Part I - Basic Principles of Risk Assessment
- ▶ Part II - An example on filling out the CityU Health & Safety Risk Assessment for Workstations, Experiments and Research Projects

Part I

Basic Principles of Risk Assessment

Basic Principles of Risk Assessment

What is a risk assessment?

- ▶ Risk assessment is a term used to describe the overall process or method where you:
 - ▶ Identify hazards and risk factors that have the potential to cause harm (hazard identification).
 - ▶ Analyze and evaluate the risk associated with that hazard (risk analysis, and risk evaluation).
 - ▶ Determine appropriate ways to eliminate the hazard, or control the risk when the hazard cannot be eliminated (risk control).

Reference: Risk Assessment, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Hazard Identification

What is a hazard?

► Definition

“A hazard is any source of potential damage, harm or adverse health effects on something or someone.”

Reference: Hazard and Risk, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Examples of Hazards

- ▶ Workplace hazards can come from a wide range of sources. General examples include any substance, material, process, practice, etc. that has the ability to cause harm or adverse health effect to a person or property. See table on the next page.

Reference: Hazard and Risk, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Examples of Hazards

Examples of Hazards and Their Effects

Workplace Hazard	Example of Hazard	Example of Harm Caused
Thing	Knife	Cut
Substance	Benzene	Leukemia
Material	Mycobacterium tuberculosis	Tuberculosis
Source of Energy	Electricity	Shock, electrocution
Condition	Wet floor	Slips, falls
Process	Welding	Metal fume fever
Practice	Hard rock mining	Silicosis
Behavior	Bullying	Anxiety, fear, depression

Reference: *Hazard and Risk, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)*

Examples of Hazards

- ▶ Workplace hazards also include practices or conditions that release uncontrolled energy like:
 - ▶ an object that could fall from a height (potential or gravitational energy)
 - ▶ a run-away chemical reaction (chemical energy)
 - ▶ the release of compressed gas or steam (pressure; high temperature)
 - ▶ entanglement of hair or clothing in rotating equipment (kinetic energy)
 - ▶ contact with electrodes of a battery or capacitor (electrical energy)

Reference: Hazard and Risk, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Risk

- ▶ Risk is 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.

Reference: Hazard and Risk, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Risk Assessment

- ▶ A risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people.

After identification is made, you analyze and evaluate how likely and severe the risk is.

When this determination is made, you can next, decide what measures should be in place to effectively eliminate or control the harm from happening.

Reference: Risk Assessment, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Risk Analysis

- ▶ A process for comprehending the nature of hazards and determining the level of risk.
- ▶ Notes:
 1. Risk analysis provides a basis for risk evaluation and decisions about risk control.
 2. Information can include current and historical data, theoretical analysis, informed opinions, and the concerns of stakeholders.
 3. Risk analysis includes risk evaluation.

Reference: Risk Assessment, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Risk Evaluation

- ▶ The process of comparing an estimated risk against given risk criteria to determine the significance of the risk.

Reference: Risk Assessment, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Risk/Hazard Control

- ▶ The main ways to control a risk/hazard include:
 - ▶ Elimination (including substitution)
 - ▶ Engineering Controls
 - ▶ Administrative Controls
 - ▶ Personal Protective Equipment

Reference: Risk Assessment, OSH Answers Fact Sheets published by Canadian Centre for Occupational Health and Safety (CCOHS)

Elimination (including substitution)

- ▶ Principle:
To eliminate the risk from the workplace, or substitute (replace) hazardous materials or machines with less hazardous ones.
- ▶ For example:
 - ▶ Design out
 - ▶ Substitute oil-based paint by water-based paint
 - ▶ Prohibit use of asbestos

Engineering Controls

- ▶ Principle:
To reduce the risk on hardware level.
- ▶ For example:
 - ▶ Install enclosures to reduce the noise emission.
 - ▶ Install tail lift control panel with two-hand switch design.

Administrative Controls

- ▶ Principle:
To reduce the exposure to the risk/hazard.
- ▶ For example:
 - ▶ Provide training for different sector or alter the way the work is done
 - ▶ Timing of work
 - ▶ Policies and other rules
 - ▶ Work practices such as standards and operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices).

Personal Protective Equipment

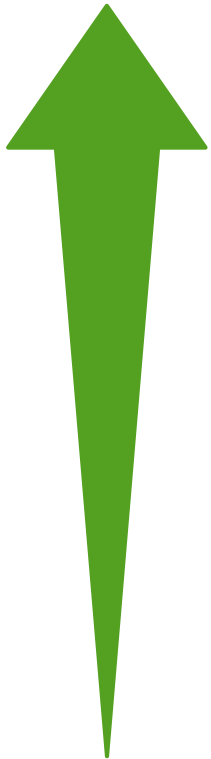
- ▶ Equipment worn by individuals to reduce exposure such as contact with chemicals or exposure to noise.



Image source: Pixabay

Hierarchy of Hazard Control

Most
Effective



Elimination

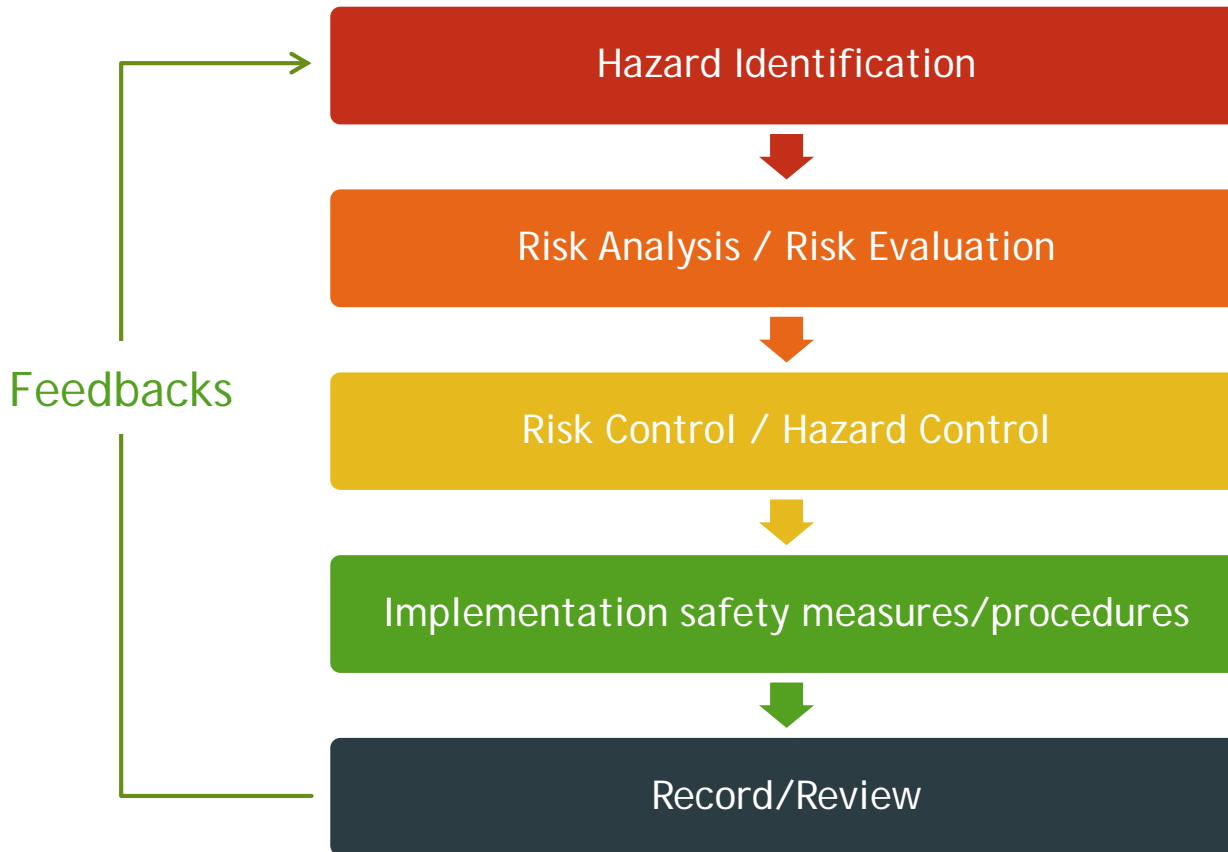
Engineering Control

Administrative Control

PPE

Least
Effective

5 Key Stages of a Risk Assessment



Part II

An example on filling out the CityU Health & Safety Risk Assessment for Workstations, Experiments and Research Projects

Example: Trimming Materials by Use of a Band Saw

▶ Step 1

- ▶ List the title of the process
- ▶ Describe the process in form of summary/abstract

1. Workstation / Experiment / Project Information

Workstation / Experiment / Project Title :

[Trim acrylic plates](#)

Summary / abstract of workstation, experiment or project (in about 100 words) :

[To trim acrylic plates in optimum size for reuse or dispose by use of band saw.](#)

Example: Trimming Materials by Use of a Band Saw

- ▶ Step 2 - Input the sequences of the process

Sequence	Description	Equipment to be used	Hazard code
1.	[Sort workpieces to be trimmed in order.]	<input type="checkbox"/>	[A6]
2.	[Install suitable saw blade.]	[Saw blade]	[A6]
3.	[Trim workpieces in optimum size.]	[Band saw]	[A1, A3, H1]
4.	[Clear saw dust and clean the work bench.]	<input type="checkbox"/>	[A3]
5.	[Sort trimmed workpieces in order.]	<input type="checkbox"/>	[A6]
6.	[Move workpieces to storage.]	[Trolley]	[Other]
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Example: Trimming Materials by Use of a Band Saw

► Step 3 - Input the risk rating

* Risk Priority Chart

LIKELIHOOD (How likely could it happen?)	CONSEQUENCES (How severely could it hurt someone?)			
	Minor	Moderate	Major	Catastrophic
Rare	L	M	H	H
Unlikely	L	M	H	E
Likely	H	H	E	E
Almost Certain	H	E	E	E

Legend

E = Extreme risk H = High risk M = Moderate risk L = Low risk

Sequence	Hazard Code	Hazard Severity	Likelihood of the Hazard Arising	Risk Ranking*
1.	[A6]	[Minor]	[Almost certain]	[H]
2.	[A6]	[Minor]	[Almost certain]	[H]
3.	[A1 A3 H1]	[Major Moderate Minor]	[Likely Likely Almost certain]	[E H H]
4.	[A3]	[Moderate]	[Likely]	[H]
5.	[A6]	[Minor]	[Almost certain]	[H]
6.	[Manual Handling]	[Moderate]	[Likely]	[H]
7.	[]	[]	[]	[]
8.	[]	[]	[]	[]
9.	[]	[]	[]	[]
10.	[]	[]	[]	[]

Example: Trimming Materials by Use of a Band Saw

- ▶ Step 3 - List of hazard codes
 - ▶ You may refer to the Attachment A of the CityU Health & Safety Risk Assessment for Workstations, Experiments and Research Projects

Checklist of Potential Hazards and the Corresponding Hazard Code

	<u>Hazard Code</u>
* Bodily injury resulting from mechanical energy	
• cut or caught on, in or between rotating or moving objects	A1
• stepping on object	A2
• struck by moving or flying object	A3
• striking against object	A4
• injured by hand tools	A5
• injured by sharp objects/materials	A6
* Biohazard (microorganisms, bacteria, viruses, handling of laboratory animals, etc)	B1
* Chemical Hazard	
• flammables (such as acetone, methane, hydrogen)	C1
• toxic chemicals (such as chloroform, ammonia)	C2
• corrosives (such as hydrofluoric acid)	C3
• peroxide forming chemicals	C4
• chemicals of explosive nature	C5
• other dangerous substances (such as nanoparticles)	C6
* Electric shock due to	
• contact with exposed live component	D1
• use of high power/voltage source	D2
• design of own power source	D3
* Fire or Explosion Hazard (due to use of flammables, open flame, overloading, short circuiting, etc)	E1
* Fall of a person	
• fall from height or into depth	F1
• fall on same level (i.e. slips or trips)	F2
* Falling object	
• collapse	G1
• falling object during handling	G2
* Noise at 85 dBA or above	H1
* Increased / decreased pressure	J1
* Radiation	
- Non-ionizing radiation	
• ultraviolet	K1
• laser	K2
• very high radio frequency (>1G)	K3
• far infra-red (>1µm)	K4
- Ionizing radiation	
• alpha particles	K5
• beta rays	K6
• gamma and X rays	K7
• machine producing ionizing radiation	K8
* Bodily burnt due to	
• high temperatures (handling hot metal, high temperature operations, casting, etc.)	L1
• extremely low temperatures (handling cryogenic fluids, working in freezing conditions, etc.)	L2
* Deficiency of air or oxygen	M1

Example: Trimming Materials by Use of a Band Saw

► Step 4 - Identify control measures

List of control measures suggested by staff or student :

i.	Make sure the power supply has been disconnected before installing saw blade.
ii.	Wear protective gloves before grabbing any saw blade or sharp materials. But never use protective gloves when operating the band saw.
iii.	Check and confirm the adjustable guard around the saw blade is intact and in good working condition.
iv.	Check and confirm all switches (including emergency stop switch) is intact and in good working condition.
v.	Put on eye protector and hearing protector.
vi.	Push the workpiece towards the running saw blade steadily and slowly.
vii.	Use push stick to maneuver the workpiece near the running saw blade.
viii.	Use correct posture when moving any objects.
ix.	<input type="checkbox"/>

Example: Trimming Materials by Use of a Band Saw

- ▶ Step 5 - Sign the form

I hereby declare that the information provided above is to my best knowledge true, correct and complete.

Staff / student who conducts the
assessment :

(Name in print)

Signature : _____

Date : _____

Endorsed by
Supervisor : _____

Signature : _____

Date : _____

Example: Trimming Materials by Use of a Band Saw

- ▶ Step 6 - Reviewed & endorsed by Supervisor / Principal Investigator

For Evaluation by Supervisor / Principal Investigator

Reviewed by	:	<input type="text"/>	Signature	:	<input type="text"/>
Overall risk level	:	<input type="text"/>	Date	:	<input type="text"/>
Follow-up action	:	<input type="text"/>			
		(choose from Actions 1 to 5 below)			

Example: Trimming Materials by Use of a Band Saw

► Step 6 - List of follow-up actions

Action 1 : acceptable without review

Action 2 : acceptable when proper and clear operation procedure is developed
(please attach a clear and step-by-step control procedure, jointly signed by supervisor/principal investigator and the staff / student concerned.)

Action 3 : staff / student is requested to provide the following additional information for review

Action 4 : the risk is probably high and the workstation / experiment / research project will need to be audited in more detail on []

Action 5 : the risk is high and proper control measure(s) are required to be put in place first. Workstation / Experiment / Project is suspended until further notification.

Additional Information on Risk Assessment

- ▶ Labour Department (Government of the HKSAR)
 - ▶ Five Steps to Risk Assessment [\(Eng\)](#) [\(Chi\)](#)
- ▶ Canadian Centre for Occupational Health and Safety (Government of Canada)
 - ▶ [OSH Answers Fact Sheets - Health & Safety Programs](#)
- ▶ Health and Safety Executive (Public Body of the UK)
 - ▶ [Risk Management](#)
 - ▶ [Example Risk Assessments](#)
 - ▶ [Risk Management FAQs](#)

-END-

For enquiries, please contact the Safety & Health Unit of FMO.

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