

Risk Assessment Evaluation and Control

Lecture Title: The Hierarchy of Controls in OHS

Lecturer: Ms. Mariella Camilleri

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**Undergraduate Diploma in
Occupational Health and Safety**

Lecture Aim

- Understand of the Hierarchy of Controls in OHS.
- Learn how to assess risks and select suitable control measures.
- Understand the key elements of the Permit To Work (PTW)



Risk Assessment – 5 Steps Process

Risk Assessment can be described as a 5-step process



Aim: To remove the risk or reduce it to a level that is As Low As Reasonably Practicable (ALARP).

General Hierarchy of Control

When hazards are identified through the risk assessment process, it is necessary to decide on the precautions needed to control those hazards to an acceptable level.

This is the most important part of the risk assessment – *IDENTIFYING* the further action that is needed and taking that action.



General Hierarchy of Control – Class Discussion

- Why is it important to take further action after identifying a hazard?
- What could happen if a workplace identifies hazards but doesn't take any action?
- Can you think of examples of common hazards in your daily environment? How could they be controlled?
- What does “acceptable level of risk” mean to you? Who decides what's acceptable?



General Hierarchy of Control

Elimination - Remove the hazard entirely.

- **Hazard:**
 - A machine in a factory emits harmful fumes.
- **Action:**
 - Replace the machine with a more modern one that does not emit harmful fumes.



General Hierarchy of Control

Substitution – Use a safer alternative.

Hazard:

- Using a toxic solvent in a cleaning process.



Action:

- Substitute the toxic solvent with a non-toxic, biodegrade cleaner.





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General Hierarchy of Control

Engineering Controls – Isolate People from the Hazard

- **Hazard:**
 - Noise from machinery in a manufacturing plant.
- **Action:**
 - Install soundproof enclosures around the noisy machinery.



General Hierarchy of Control

Administration Controls – Change the Way People Work

- **Hazard:**
 - Exposure to hazardous chemicals in a laboratory.
- **Action:**
 - Implement a rotating schedule to limit the time any one worker is exposed to the chemicals
 - Reduce time of exposure.
 - Supervision



General Hierarchy of Control

Administration Controls – Permit to Work (PTW)

Permit to Work Form to Include:

- Permit Title.
- Permit Number.
- Job Location.
- Plant Identification.
- Description of work (& limitations).
- Hazard Identification.
- Precautions.
- Protective Equipment.
- Authorization Signature (isolations/precautions/date, time, duration of permit).
- Acceptance.
- Extension / shift hand-over procedures.
- Hand back.
- Cancellation.
- Signature.



General Hierarchy of Control

Administration Controls – Permit to Work (PTW) 1of2

WHY we require the Permit To WORK (PTW)

- To ensure workers are not exposed to hazards and safety devices are placed before work can commence
- Employees do not cause hazardous conditions for others.
- Ensure personnel have understood what work need to be carried out.



General Hierarchy of Control

Administration Controls – Permit to Work (PTW) 2of2

WHY we require the Permit To WORK (PTW)

- Faulty equipment is removed or repaired.
- Safety devices are replaced after work is completed.
- Normal work can resume.



General Hierarchy of Control

Administration Controls – Permit to Work (PTW)

List other permits in use at same time & location <small>(To be filled in by Permit Authoriser)</small>		Permit no. <small>(To be filled in by worker)</small>		
WORK AT HEIGHT PERMIT				
Section 1 – Basic Permit Information – To be filled in by permit Authoriser prior to commencing work				
Location:		High Hazard Area: Yes ☐ No ☐		
Description of Work:				
Potential Hazards:				
☐ Electrical ☐ Mechanical ☐ Hazardous Energy ☐ Fire / Heat	☐ Explosion ☐ Lighting ☐ Noise ☐ Work equipment	☐ Material Handling & Ergonomics ☐ Biological ☐ Fall from height		
		☐ Falling objects ☐ Slips, trips & falls ☐ Traffic movement ☐ Hazardous substances		
Date & Time Permit applies:		Environment comfort factors ☐ Others Specify:		
Day / month / year Time hrs		authorised duration Are workers trained to carry out this work? Yes ☐ No ☐		
Working Team				
GSD Employees ☐ *Contractor Employees ☐		Name of Contracting Company:		
Name & Surname & signature that permit contents are understood		Name & Surname & signature that permit contents are understood		
Section 2 – Safety Instructions				
Safety instructions to be followed	To be filled out by Permit Authoriser prior to commencement of works		To be completed by worker at start of works Instructions followed? (Y / N / N/A)	Inspection by Supervisor during works Instructions followed? (Y / N / N/A)
	Comments	Instruction applicable? (Y / N/A)		
Equipment and systems inspected and are appropriate to use in work environment – Specify type of equipment in comments				
If equipment is a mobile scaffolding please refer to checklist GSD/H F0379. Inspect and document prior use				
Inspect, anchor, assemble, and use fall protection and rescue equipment safely, illumination appropriate				
Energy sources locked out				
In case of hot work combustibles within 15.2m are moved or covered				

General Hierarchy of Control

Administration Controls – Permit to Work (PTW)

PPE provided and inspected – specify PPE in comments		Permit no. _____ (To be filled in by Permit Authoriser)	
Identified fall hazards		List other permits in use at same time & location (To be filled in by Permit Authoriser)	
Conduct fall protection and rescue procedures			
Warning signs / barricades placed			
Name of rescuer responsible for the ABOVE:			
Safety instructions to be followed (continued)	To be filled out by Permit Authoriser prior to commencement of works	To be completed by worker at start of works	Inspection by Supervisor during works
	Comments	Instructions applicable? (Y / N / N/A)	Instructions followed? (Y / N / N/A)
Other persons affected by the work removed from area			
Tie-off points identified			
All equipment is inspected prior to use			
Section 3: Permit Authorisation & Signing Off on Safety Checks:			
Work authorised?	Permit Authoriser Name & Surname:	Signature:	Date: ____/____/____
Safety instructions check (section 2) completed at start of works	Worker carrying out checks - Signature:	Date: ____/____/____	Time: ____:____hrs
Safety instructions inspection (section 2) completed by supervisor during works	Supervisor Name, Surname & Signature:	Date: ____/____/____	Time: ____:____hrs
Section 4 – To be filled in only in case of an Emergency stop to works			
Works stopped due to emergency situation	Name of person stopping works:	Signature:	Date: ____/____/____ Time: ____:____hrs
Reasons for stopping works & measures taken:			
Section 5 – To be filled in after work is completed			
Checks after completion of works	To be completed by worker at end of works (Y / N / N/A)	To be completed by Supervisor at end of works (Y / N / N/A)	Work completion Date & Time: ____/____/____ ____:____hrs day month year time
All equipment removed			Worker Signature: _____
All lockouts and tag outs removed			
Area cleaned			

ON COMPLETION OF WORK KINDLY FORWARD THIS FORM TO THE H&S OFFICE

General Hierarchy of Control

Administration Controls – Permit to Work (PTW)

Ref to LN 41/2004 (Work Places Regulations Confined Spaces) - The Importance of carrying a RA and PTW.

<https://legislation.mt/eli/sl/646.19/eng>

To access and discuss



General Hierarchy of Control

Personal Protective Equipment (PPE) – Under the
Maltese Law S.L. 646.13 (Legal Notice 121 of 2003).



<https://legislation.mt/eli/sl/646.13/eng>

To access and discuss



General Hierarchy of Control

Scenario: Hot Work in a Confined Space

Task: A worker needs to weld inside a storage tank.

Hierarchy of Controls Application:

- Elimination: Can the welding be avoided (e.g., replace with bolted joints outside the tank)?
- Substitution: Use a cold bonding method instead of welding.
- Engineering Controls: Ensure mechanical ventilation to remove fumes.
- Administrative Controls:
 - Issue a Hot Work Permit and Confined Space Entry Permit.
 - Assign a fire watch and continuous gas monitoring.
- PPE: Use flame-resistant clothing, gloves, helmet, and respirator.
- PTW Link: Hot Work & Confined Space Permits required before starting.



General Hierarchy of Control

Scenario: Electrical Maintenance

- Task: Electricians need to replace a damaged circuit breaker.
- Hierarchy of Controls Application:
- Elimination: Isolating the power completely before maintenance.
- Substitution: Replace with lower-voltage or safer equipment if possible.
- Engineering Controls: Lockout–Tagout (LOTO) devices installed.
- Administrative Controls:
 - Electrical Work Permit issued.
 - Only competent, authorized personnel allowed.
- PPE: Use insulated gloves, face shield, and arc-rated clothing.
- PTW Link: Electrical Work Permit to ensure isolation and authorization.



General Hierarchy of Control

Scenario: Chemical Handling

- Task: Workers transferring corrosive chemicals from a storage tank to a smaller container.
- Hierarchy of Controls Application:
- Elimination: Use pre-mixed solutions to avoid handling concentrated chemicals.
- Substitution: Replace with a less hazardous chemical if possible.
- Engineering Controls: Install automated transfer systems and spill containment.
- Administrative Controls:
 - Training and supervision.
 - Permit to Work for chemical transfer operations.
- PPE: Chemical-resistant gloves, face shield, and apron.
- PTW Link: PTW ensures all precautions (ventilation, spill kits, supervision) are in place.



General Hierarchy of Control

Scenario: Working at Height

- Task: Maintenance on lighting fixtures at 8 meters high.
- Hierarchy of Controls Application:
 - Elimination: Can work be done from the ground using extendable tools?
 - Substitution: Use mobile platforms instead of ladders.
 - Engineering Controls: Guardrails, harness anchor points.
 - Administrative Controls:
 - Working at Height Permit issued.
 - Trained personnel only.
 - PPE: Full-body harness, helmet with chin strap.
- PTW Link: Work at Height Permit ensures risk assessment and fall protection compliance.





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