NATIONAL UNIVERSITY OF SINGAPORE

Activity-Based Risk Assessment Form

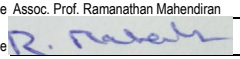
Name of Department	**Department of Physics**	**Location of Lab**	**S7, S11, S12, S13, S16**
Name of Laboratory	**Department of Physics**	**Name of PI**	**Department Safety Committee**
Name of Researcher/LO	Department Safety Committee	**Name of Activity/Experiment**	Changing of Gas Cylinders

No	Description/Details of Steps in Activity	Hazards	Possible Accident / Ill Health & Persons-at-Risk	Existing Risk Control (Mitigation)	Severity	Likelihood (Probability)	Risk Level	Additional Risk Control	Person Responsible	By (Date)
1	Extracting and transporting ***new*** cylinder from storage area. (Either Research groups' designated stroage area or Department's Gas Storage Yard at S7 Level 1) to usage area.	Manual handling	Muscle strain, back injury	Use mechanical aids (e.g., trolley), proper lifting techniques, training on manual handling. Where possible, work as a group of 2 to handle the gas cylinder.	1	2	2			
		Falling cylinder, crushing injury	Foot injury, fractures	Use cylinder trolley with secure straps, wear steel-toe boots, move cylinders carefully.	2	1	2			
2	Disconnecting ***used/empty*** gas cylinder.	Gas leaks	Asphyxiation, exposure to toxic gases, explosion, fire	Ensure cylinder valve is properly closed. Ensure proper ventilation. Check for leaks using soapy water test. Wear PPE (gloves, safety goggles) when disconnecting gas lines.	3	1	3			
3	Setting aside ***used/empty gas*** cylinder and moving new cylinder into gas cylinder bracket or rack.	Manual handling	Muscle strain, back injury	Use mechanical aids (e.g., trolley), proper lifting techniques, training on manual handling. Where possible, work as a group of 2 to handle the gas cylinder.	1	2	2			
		Falling cylinder, crushing injury	Foot injury, fractures	Use cylinder trolley with secure straps, wear steel-toe boots, move cylinders carefully. Ensure that cylinder is secured properly with cylinder chain at the cylinder bracket or rack.	2	1	2			
4	Connecting ***new*** gas cylinder	Gas leaks, incorrect fitting	Asphyxiation, exposure to toxic gases, explosion, fire	Use correct fittings. Ensure fittings are secured properly. Ensure proper ventilation. Check for leaks using soapy water test. Wear PPE (gloves, safety goggles) when connecting gas lines.	3	1	3			
5	Switching on gas supply.	Gas leaks at output end of gas line.	Asphyxiation, exposure to toxic gases, explosion, fire	Ensure that output line of the gas supply is secured properly and conduct leak test where applicable.	3	1	3	Laboratories and facilities to ensure that gas connections in are checked regularly and gas detectors are installed.		
6	Extracting and transporting ***used/empty gas*** cylinder to storage area.	Manual handling	Muscle strain, back injury	Use mechanical aids (e.g., trolley), proper lifting techniques, training on manual handling. Where possible, work as a group of 2 to handle the gas cylinder.	1	2	2			
		Falling cylinder, crushing injury	Foot injury, fractures	Use cylinder trolley with secure straps, wear steel-toe boots, move cylinders carefully.	2	1	2			

Conducted By Tan Jyh Harng

Approved By

Name Assoc. Prof. Ramanathan Mahendiran

Signature 

Approval date 15 Apr 25

Next Revision date (Maximum 3 years) 15 Apr 28

		Likelihood		
		Likely	Possibly	Unlikely
Severity	Low	3	2	1
	Med	6	4	2
	High	9	6	3

Risk = Likelihood x Severity

RISK	DECISION PROCESS
< 3	**RISK ACCEPTABLE**
3, 4	**CONSIDER ADDITIONAL RISK CONTROL**
> 4	**ADDITIONAL RISK CONTROL REQUIRED**

Likelihood

1	**Unlikely**	Not likely to occur (has not occurred in the PI's Lab or similar Lab setup.)
2	**Possible**	Possible or known to occur (has occurred in the PI's Lab or Similar Lab setup.)
3	**Very Likely**	Common or repeating occurrence (has occurred repetitively in the PI's Lab or similar Lab setup.)

Severity

1	**Low**	(e.g. No injury, injury or ill-health requiring first aid treatment only - includes minor cuts and bruises, irritation, ill-health with temporary discomfort)
2	**Medium**	(e.g. Injury requiring medical treatment or ill-health leading to disability – includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders)
3	**High**	(e.g. Fatal, serious injury or life-treatening occupational disease – includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning and fatal diseases)

Severity - Consider the magnitude/severity of the consequences of the Risk Factor occurring and then list this as 3 (High), 2 (Moderate) or 1 (Low).
Severity normally will not change unless there is a physical change to the equipment or process.

Likelihood - Team should rely upon their experience and consider realistic scenarios. Listed below are examples of factors that may be considered in determining the likelihood.

- Past experience / incidents
- Complexity of the activity
- Number of personnel involved in the activity (e.g. all personnel, a limited number of trained personnel, etc)
- Frequency of use or execution
- Degree of control (involvement of contractors)
- Strength/completeness of administrative controls
- Sufficiency/formality of training
- Other....