Experiment-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**	
Name of Researcher/LO	**Department Safety Committee**	**Name of Activity/Experiment**	**Safety Handling of Liquid N2**

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	Moving the dewar to and from designated place for dispensing the Liquid N2.	Physical Hazard.	Injuries to people due to toppl;ing of dewar. May result in crushing impact if dewar is full	1) Use the correct trolleys when transporting the dewar. 2) Ensure the dewar was secured to the trolley before moving. 3) The person moving the dewar must be physically capable of carrying out this task. If not imply the buddy system. 4) Keep the floor clear of obstacles for this task.	2	1	2			
2	Dispensing of Liquid N2 from main storage tank to dewar.	Cryogenic Hazard	Contact with cryogenic liquid, its boil-off gases, or components cooled to these low temperatures can readily cause frostbite or Cryogenic burns.	Put on proper PPE, i.e., safety shoes, cryogenic glove, cryogenic apron and face shield.	2	1	2			
3	Dispensing of Liquid N2 from main storage tank to dewar.	Explosion Hazard	1. Cryogenic fluids confined and allowed to warm can generate very high pressures. 2. The function of vent lines can be defeated by the formation of ice (from condensed moisture) in the vent line. 3. If a cryogenic fluid is subjected to a large amount of heat input, a flash vaporization can occur.	1. Ensure that main valve of Liquid N2 main valve to be open gently, otherwise the pressure of Cryogenic liquid may cause injury to the user and people nearby. 2. Ensure that the person involved is familiar with the operations and well trained. 3. Proper PPE, i.e., safety shoes, cryogenic glove, cryogenic apron and face shield.	2	1	2			
4	Dispensing of Liquid N2 in enclosed area.	Explosion Hazard	1. Cryogenic liquids should only be handled in apparatuses specifically designed for that purpose. 2. Accidents frequently occur when equipment not designed for cryogenic service is used, such as when a consumer-rated Thermos® bottle is used for LN2 or dry ice. Overpressure that ruptures the container is frequently the result. 3. Accidents can also occur when cryogenic-rated equipment is inappropriately modified and the original safe-venting design is compromised.	1. Put on proper PPE, i.e., safety shoes and hand glove. 2 Ensure that the person involved is familiar with the operations and well trained.	2	1	2			

		Asphyxiation Hazard	The use of liquid nitrogen can be hazardous because of the significant expansion in volume as it transitions into a gas. When it warms to 21°C, its volume increases by 696 times as it becomes gaseous nitrogen. An oxygen concentration below 19.5% is considered oxygen-deficient, and the resulting displacement of oxygen from the air can lead to dizziness, nausea, or even asphyxiation without warning.	1.Install an oxygen monitor with an audible alarm if needed 2. Ensure all parts of dewars are in proper functioning condition •3.Use a suitable insulated transfer line/hose to reduce the evaporation of liquid nitrogen and reduce frost and condensation during transfers 4.Transfer liquid nitrogen in a well-ventilated area	2	1	2			
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Conducted By Daren POH

Approved By

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Signature

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Next Revision date (Maximum 3 years 24 April 2028