

OHS017

OHS Risk assessment and control form

Completed by: Adelle Amoore

Staff/Student number:



UNSW THE UNIVERSITY OF NEW SOUTH WALES

For additional information refer to HS329 <https://www.gs.unsw.edu.au/policy/documents/HS329.pdf>

Faculty/Division: UNSW Analytical Centre, DVC (Research)		School/Unit: All schools and units NMR Facility		
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Risk assessment name Standard operating procedures in the nuclear magnetic resonance (NMR) spectrometer room.

Step 1: - Identify the Activity and the location of the activity

Description of Activity	<ol style="list-style-type: none"> 1) Approaching the large magnetic field 2) Cryogenics maintenance (liquid helium and liquid nitrogen). 3) Changing cables and wires 4) The loading and removing of NMR samples.
Description of Location	UNSW Analytical Centre, F10 Chemical Sciences Building, NMR Facility Room B41.

Step 2: - Identify who may be at risk by the activity: A number of people may be at risk from any activity. This may affect the risk controls needed. These people may include fellow workers, visitors, contractors and the public. The location of the activity may affect the number of people at risk

Persons at Risk	<ol style="list-style-type: none"> 1) Those who may be at risk by this activity includes anyone who enters the NMR facility (B41). 2) It also includes anyone who approaches the NMR within the magnet's 5 gauss line, cordoned off by the RED chain.
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Step 3 to 7:- Identify Hazards, Risks and risk controls.

1. An activity may be divided into tasks. For each task identify the hazards and associated risks
2. List existing risk controls and determine a risk rating using the UNSW Risk Rating Procedure
3. Additional risk controls may be required to achieve an acceptable level of risk (Use hierarchy for risk controls).Re-rate the risk if additional risk controls used.

Tasks	Hazards (Step 3)	Associated risks (Step 4)	Existing risk controls	Risk rating with existing controls *			Additional risk controls required (Step 6)	Risk Rating with additional controls *		
				(Step 5)				(Step 7)		
				C	L	R		C	L	R
<i>Approaching the large magnetic field</i>	Metal tools, gas cylinders belt buckles, persons fitted with pacemakers, metallic implants and prostheses, steel tipped shoes, and any other metal object (analogue watches, calculators and certain types of credit cards and mobile phones) on the person may be strongly attracted when close to the magnet	Magnetic objects flying towards the magnet pose threat of serious injury/death to any person in the way.	<i>Anyone approaching the magnetic field (ie passing over the RED chain) MUST remove ALL metal objects. Persons fitted with pacemakers or metallic implants and prostheses should not get closer than the 5 gauss line.</i>	2	C	MED	Safety Hazards signs are displayed at the entrance of the NMR facility. Caution and Warning signs are displayed on each magnet. Each NMR user undergoes a Safety induction prior to the use of the magnets in the facility. .	L	D	LOW
Cryogens maintenance (liquid helium and liquid	Magnet quenching (the rapid release of gaseous cryogens from	Cryogen may cause burns/irritation if the liquid comes in contact with	Personnel should evacuate the NMR laboratory IMMEDIATELY if a magnet quenches. Gloves, eye protection, and closed shoes (NOT STEEL CAPPED) must be	5	E	MED	Gas detector will be activated in an event of a quench or a drop in oxygen levels.	1	E	LOW

Tasks	Hazards (Step 3)	Associated risks (Step 4)	Existing risk controls	Risk rating with existing controls *			Additional risk controls required (Step 6)	Risk Rating with additional controls *		
				(Step 5)				(Step 7)		
				C	L	R		C	L	R
nitrogen).	the cryostat into the room) or a cryogenic container failure.	the skin. or asphyxiation.	worn during cryogen maintenance. All doors should be propped open to increase ventilation. Only stainless steel transfer lines are to be used to avoid problems of cracking or magnetic attraction. Tanks on wheels are transported on purpose built stable trolleys. The transfer must be continuously attended. No access to the pit (DMX 600) is permitted during nitrogen fills as exit is hampered and the cold Nitrogen gas is denser than air.							
Changing cables and wires	Electrical Hazards	Electrocution	Changes to cables and wiring should only be made by NMR Facility staff. Ensure power is off during this task.	1	E	LOW	Equipment is tested and tagged periodically. Conduct visual check on equipment prior to use.	1	E	LOW
The loading and removing of NMR samples into the magnet.	Chemical exposure of organic solvents in NMR tube.	Organic solvent may cause irritation to eyes and skin upon contact.	Samples in organic solvents should NOT be prepared in the spectrometer rooms All NMR samples must be labelled with owners name and an appropriate identifier to avoid safety issues of unknown	2	D	LOW	Read MSDS prior to handling of chemicals.	2	D	LOW

Tasks	Hazards (Step 3)	Associated risks (Step 4)	Existing risk controls	Risk rating with existing controls *			Additional risk controls required (Step 6)	Risk Rating with additional controls *		
				(Step 5)				(Step 7)		
				C	L	R		C	L	R
	Effect of exposure to static magnetic fields <u>unknown</u> .		<p>compounds.</p> <p>All spills/breakages outside the magnets should also be cleaned up using the appropriate methods outlined in the relevant MSDS.</p> <p>NMR workers should spend no longer than reasonably necessary within the 5 gauss line for sample changing and adjustments</p>	1	E	LOW				

Step 8: :- List Emergency procedures and controls .List Emergency controls for how to deal with fires, spills or exposure to hazardous substances and/or emergency shutdown procedures

Stainless steel bollards and a plastic red chain have been used in the facility to display the 5 gauss line.

The first aid kit is valid and accessible (in room B41) to all NMR Users.

Key card access is required to enter this facility at all hours (access is prevented to unauthorized persons).

Oxygen depletion sensors located in B41 activates an alarm in the event of excessive cryogen release which also triggers a ventilation system.

Step 9:- Additional controls Implementation

Date all controls implemented : since 2007

I(name): Dr Adelle Amoore have implemented the controls identified in step 6 (signature)

Step 10:- List legislation, standards and codes of practice relevant to this risk assessment

Occupational Health and Safety Act 2000

Occupational Health and Safety Regulation 2001

Step 11:- Authorisation

Authorised by: Dr Donald Thomas

Date: 2020

Signature:

Step 1 – Consider the Consequences	Step 2 – Consider the Likelihood	Step 3 – Calculate the Risk																																											
What are the consequences of this event occurring? Consider what <u>could reasonably</u> happen with existing controls in place or if an incident has occurred consider what <u>could have reasonably</u> happened as well as what actually happened. Look at the descriptions and choose the most suitable Consequence.	What is the likelihood of the consequence identified in step 1 happening? Look at the descriptions and choose the most suitable Likelihood	1. Take the consequences rating (1-5) and select the correct column 2. Take the likelihood rating(A-E) and select the correct row 3. Select the risk rating where the two ratings cross on the matrix below. VH = Very high, H = High, M = Medium, L = Low																																											
<p>5. Severe : death or permanent disability to one or more persons</p> <p>4. Major : hospital admission required</p> <p>3. Moderate :medical treatment required</p> <p>2. Minor : first aid required</p> <p>1. Insignificant: injuries not requiring first aid</p>	<p>A. Almost certain: expected to occur in most circumstances</p> <p>B. Likely: will probably occur in most circumstances</p> <p>C. Possible: could occur at some time</p> <p>D. Unlikely: is not likely to occur in normal circumstances</p> <p>E. Rare: may occur only in exceptional circumstances</p>	<table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="5">CONSEQUENCES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <th rowspan="5">LIKELIHOOD</th> <th>A</th> <td>M</td> <td>H</td> <td>H</td> <td>VH</td> <td>VH</td> </tr> <tr> <th>B</th> <td>M</td> <td>M</td> <td>H</td> <td>H</td> <td>VH</td> </tr> <tr> <th>C</th> <td>L</td> <td>M</td> <td>H</td> <td>H</td> <td>VH</td> </tr> <tr> <th>D</th> <td>L</td> <td>L</td> <td>M</td> <td>M</td> <td>H</td> </tr> <tr> <th>E</th> <td>L</td> <td>L</td> <td>M</td> <td>M</td> <td>M</td> </tr> </tbody> </table>			CONSEQUENCES					1	2	3	4	5	LIKELIHOOD	A	M	H	H	VH	VH	B	M	M	H	H	VH	C	L	M	H	H	VH	D	L	L	M	M	H	E	L	L	M	M	M
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Risk level	Required action
Very high	Act immediately: The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the hierarchy of risk controls.
High	Act today: The proposed activity can only proceed, provided that: (i) the risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls; (ii) the risk controls must include those identified in legislation, Australian Standards, Codes of Practice etc. (iii) the risk assessment has been reviewed and approved by the Supervisor and (iv) a Safe Working Procedure or Safe Work Method has been prepared. (v) The supervisor must review and document the effectiveness of the implemented risk controls.
Medium	Act this week: The proposed task or process can proceed, provided that: (i) the risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls; (ii) the risk assessment has been reviewed and approved by the Supervisor and (iii) a Safe Working Procedure or Safe Work Method has been prepared.
Low	Act this month: Managed by local documented routine procedures which must include application of the hierarchy of controls.