Form for the Assessment of Cryogenic Apparatus

Filled in by ……. Date ……..

Initial assessment

Room Number/ Space being analysed	
Note: the calculation below can be done using a spreadsheet at http://www.phy.cam.ac.uk/hands/hazards/cryogens.php	
Maximum quantity of cryogen in the room at one time (include Dewars that are brought in for filling purposes)	
Volume of gas if it evaporates (x 680 for nitrogen, x 740 for helium)	
Convert to cubic metres (1000 litres in one cubic metre), V_1	
Volume of the room, V	
Fraction of oxygen left if all the cryogen escapes (simple model: $0.21 (1 – V_1/V))$	
Is this less than 0.18?	*If yes, go to the next section. If no, go to the last section.*

Planning to reduce likelihood of having an oxygen deficient atmosphere.

How could the cryogen escape? (e.g. slow boil off, quench, knocking the Dewar over) The measures you need will depend on the way in which the cryogen is released.	
Can it be prevented from happening? (e.g. ensuring that the vent is to the outside, or that a Dewar is not left in the room)	
If the ventilation were improved, could this solve the problem? (check about the arrangements at night).	
Are the preventative measures dependent on a human being remembering something? (If so, they are inherently less sound).	
Action Plan	

Contingency planning

Is it still reasonably foreseeable that the cryogen could escape into the room, and render the atmosphere less than 18% oxygen?	
Are there any procedural measures that can reduce the likelihood?	
Will it be obvious that the cryogen has escaped? (e.g. will there be a warning sound so that I do not enter a room with little oxygen in it)	
Do you have an emergency plan to handle this situation?	
Have the personnel in the area been fully informed? Have they practised it?	
Have arrangements been made to maintain and test any monitoring equipment, or equipment needed for rescue purposes?	

If there is still a perceived need for rescue with the use of breathing apparatus, then please see the Safety Officer, since this needs a permit-to-work system (i.e., rescuers need to be trained, ready and standing by whenever the dangerous operation is being carried out).

Skills and procedures

Does everyone know how to use the Dewars correctly? (e.g. the right taps, the right way to use a transfer tube, the right clothing to wear, etc.)	
Does everyone know what to do if they make a mistake? (e.g. knock over a Dewar, break off a tap, etc)	
Does everyone know what to do if they hear an oxygen alarm?	
Does everyone know what to do if they find a vapour cloud?	
Does everyone know what to do if they see a person collapsed on the floor in a room?	
Does everyone wear the correct personal protective clothing when transferring cryogens? (gloves and specs)	

The list of people, to whom the above questions regarding procedures and emergency

procedures relates, is kept ……

Jane Blunt, December 2010