

To Vice-Presidents/Deans, Heads of Schools, HoFAs  
From Dr Melanie Taylor, University Safety Advisor  
Date 17 June 2008  
cc Prof M Case, Dr S A Robson, Dr D Barker, Prof P Heggs  
School Safety Representatives  
Reference Safety Circular 3/2008

## Risk assessments and the Control of Substances Hazardous to Health Regulations 2002

Many of you will be aware that there was an explosion and fire in a fume cupboard in the John Garside Building on 17<sup>th</sup> March. Fortunately, and largely by chance, no-one was seriously injured. The incident involved a 3<sup>rd</sup> year Chemistry PhD student scaling up an experimental procedure to generate hydrogen azide, a heat- and shock-sensitive substance.

An in-depth investigation by the Safety Office revealed significant shortcomings in the way in which COSHH and risk assessments were carried out. The purpose of this circular is to draw your attention to what went wrong, and to publicise how schools can ensure they implement good (and best) practice.

Please circulate the information contained in the Appendix to all those in your school who use substances that require a COSHH assessment, and assess whether your own arrangements already represent good practice or whether improvements are required. Your School Health & Safety Committee should formally receive this circular, and report on any improvements that need to be implemented locally.

As usual, further advice is available from your University Safety Co-ordinator.

Dr Melanie Taylor  
University Safety Advisor

## Appendix

	What went wrong	Good practice recommendation
1.	<p>The only copy of a relevant COSHH assessment was pinned to the fume cupboard, and perished in the fire.</p> <p>There is no direct evidence of whether an assessment was made, and if it was suitable and sufficient.</p>	<p>Copies of COSHH and other assessments must be kept securely, probably remote from a laboratory setting. This could be either electronically, provided it contains ALL the relevant information, (with back-up), or at least one other hard copy kept away from the laboratory.</p> <p>The School of Chemistry use handwritten triplicate books. One copy is placed near the experiment, the researcher keeps a second copy and the third copy is passed to the SSA for archiving.</p>
2.	<p>The COSHH assessment from a previous experiment (involving a smaller quantity of the heat-sensitive substance) indicated the need for a "special facility". In other words, the use of a standard fume cupboard was not considered sufficient.</p> <p>The experiment was carried out in a standard fume cupboard.</p>	<p>Many COSHH (and other risk) assessments use scoring systems, the top end of which advise the assessor to seek further information or use specialist facilities. Where any assessment reaches this conclusion, the matter must be discussed and resolved before proceeding, and a record must be kept of the decision.</p> <p>Resolution in this particular case could have involved smaller quantities, use of a blast screen, use of a fume cupboard fitted with an automatic fire suppression system, or perhaps a combination of these measures.</p>
3.	<p>COSHH assessments were available for other procedures in the same lab, but it was clear that no assessments had been made of the fire and explosive risk – for this or other procedures.</p>	<p>COSHH legislation is aimed at eliminating or controlling risks to <b>health</b>, not physical hazards such as fire and explosion, electric shock, etc. The forms are not designed or intended to cover other risks, although some forms in use at the University include references to other regulations such as the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR).</p> <p>A competently completed <b>risk</b> assessment is the key here and is the first step when assessing any work activity. A risk assessment would identify ALL the risks present in a procedure, and enable the assessor to focus on the significant risks – in this case, the risk of fire and explosion was at least as important as the health risk.</p> <p>NB The University COSHH assessment form has been amended to clarify this point, and is available at</p>

		<a href="http://www.campus.manchester.ac.uk/healthandsafety/forms.htm">http://www.campus.manchester.ac.uk/healthandsafety/forms.htm</a>
4.	Records of risk and COSHH assessment training were incomplete, and in this case the PI training last took place more than 4 years ago.	<p>Training, and refresher training are essential elements of being able to prove that the University has taken reasonable steps to understand and control the risks arising from their researches.</p> <p>As a bare minimum, those staff involved in carrying out COSHH assessment should have attended the University's training course (or equivalent), STDU Course Ref HS50 (for lab-based staff) or HS49 (for non-lab staff). This does address the context and limitations of COSHH assessments, the need to keep copies, amend and update them, etc.</p> <p>It does not address very specific aspects of some work. For example, where scaling up is envisaged, it will usually be appropriate to seek expert advice (eg from a chemical engineer or other specialist).</p>
5.	In this case, the academic supervision was attentive and thorough. However, COSHH assessments were not signed off.	<p>Where the School's arrangements are for PIs and other supervisors to sign off COSHH assessments, this must be done in a visible way so that it is clear who has overall responsibility.</p> <p>See HSC's publication 'Managing health and safety aspects of research in higher and further education' ISBN 0717613003 on the role and responsibilities of PIs (available via your University Safety Co-ordinator), and the University's own Health &amp; Safety Policy Statement at <a href="http://www.campus.manchester.ac.uk/healthandsafety/policy2.htm">http://www.campus.manchester.ac.uk/healthandsafety/policy2.htm</a></p>
6.	The evidence that COSHH assessments were not signed off should have been picked up during routine monitoring and self-inspections visits.	<p>Schools / Institutes should be carrying out their own checks and inspections to ensure that procedures are followed. Missing signatures are easy to spot and should be followed up.</p> <p>Monitoring should also check for :</p> <ul style="list-style-type: none"> <li>• comprehensive risk assessments that include all significant risks, not just health risks in COSHH assessments</li> <li>• assessments that have been updated in the light of procedural changes</li> <li>• control measures used are consistent</li> </ul>

		with those indicated in the assessment.
7.	<p>Procedures in accordance with established accounts in authoritative journals were adopted – and altered – without detailed examination of the consequences. In this particular case, quantities and the combination of substances and the solvent were changed.</p> <p>The perception was that these procedures are small-scale and well-understood, and there are no adverse reports in the literature. In fact, at least 2 other explosions of hydrogen azide have taken place in University laboratories, including one prosecuted by the HSE.</p>	<p>There should be a process for managing change in these circumstances.</p> <p>Chemical Engineers and others use Standard Operating Procedures (SOPs) which convert a brief journal account into a more detailed, step-by-step account of the actions to be taken. Any departure from the SOP requires PI approval.</p>