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Scope
The purpose of this guidance is to;

- briefly summarise the duties applicable to work with hazardous substances as described in the Control of Substances Hazardous to Health (COSHH) regulations 2002 (as amended) and;
- assist in the completion of a COSHH risk assessment.

It is not a comprehensive overview of the COSHH regulations and the requirements thereof. This can be found in the HSE document, COSHH Approved Code of Practice (ACOP). Although work with biological agents is encompassed by the COSHH regulations, biological agents are beyond the scope of this guidance and those wishing to risk assess work involving such hazards should use the BioCOSHH risk assessment form and refer to the associated BioCOSHH guidance. Radioactive substances are subject to separate legislation and information regarding Prior Radiation Risk Assessment can be found under Radiation Protection on the OHSS website.

Summary of COSHH requirements
The COSHH regulations impose duties on the University to protect staff and any other persons against health risks that may arise from work activities that expose them to hazardous substances. They include;

- identifying the hazards and assessing the risks to health arising from the use of hazardous substances during a work activity;
- deciding what control measures are required to prevent or control exposure;
- ensuring that control measures are properly implemented and maintained;
- monitoring the exposure of users to hazardous substances if appropriate;
- providing health surveillance if appropriate;
- providing information, instruction and training to users of hazardous substances to ensure safe working practices and competency;
- ensuring sufficient arrangements to deal with any accidents, incidents and emergencies that are reasonably foreseeable.

As a result the University will not allow work activities that can expose employees to hazardous substances to commence until a suitable and sufficient risk assessment has been carried out. Risk assessments should be carried out by a ‘competent person’ who should (as stated in the COSHH ACOP);

- know how the work activity uses, produces or creates substances hazardous to health;
- have the knowledge, skills, training and experience to make sound decisions about the level of risk and the measures needed for prevention or adequate control of exposure;
- have the ability and the authority of the employer to collate all the necessary, relevant information.
Responsibility for carrying out and implementing the risk assessment for a specific programme of work is delegated to the Principal Investigator (PI) (or similar responsible person) who supervises the work activity.

Briefly, a ‘suitable and sufficient’ risk assessment should consider (as described in the COSHH ACOP):

- all hazardous substances used or produced (either intentionally or as waste or by products) of the work activity);
- the physical and chemical properties of the hazard including the physical form of the hazard and the amount or concentration used;
- the people who could be exposed to the hazard including those who may be at increased risk;
- the types and extent of exposure and the potential health effects or injury;
- the measures necessary to control exposure;
- other requirements, including exposure monitoring, health surveillance, provision of training and procedures for accidents and emergencies;
- the additional requirement regarding substances known, or suspected, to be carcinogens, mutagens or asthmagens, where there is a more compelling reason for the employer to substitute with a less toxic alternative. Where substitution is not reasonably practicable, adequate procedures, training, instruction and supervision should ensure that exposure is reduced to as low reasonably practicable.

Newcastle University’s COSHH risk assessment is designed to facilitate consideration of the above and to meet the duties imposed upon the University under the COSHH regulations. The COSHH ACOP explains the above points in more detail and they will also be expanded upon in the next section of this document.

**How to fill out a COSHH risk assessment**

**Section 1: project details**

1.5. Brief description of the work activity

Provide a clear and concise description of the work activity to enable other people and non-experts to understand the exact nature of the work (e.g. other workers, safety officers or Health and Safety Executive (HSE) inspectors). The work activity for the purpose of risk assessment includes everything from opening the container to disposal of waste.

1.7. Revision date

The assessment should be reviewed every 2 years and immediately if there is reason to believe that it is no longer valid (e.g. after an accident/incident), if there is a significant change in the work activity to which it relates or if the results of health surveillance or monitoring indicate it to be necessary.
Section 2: Emergency Quick Reference

Sections 2.1 to 2.6 are designed to give quick access to information in an emergency and are therefore located on the first page of the risk assessment. Additional rows can be added to the table as required. It is advisable that this section is completed last, after the full risk assessment has been considered.

2.1. Emergency Contacts

Provide two emergency contacts. Once of these should be the principal investigator or similar person responsible for the work activity. Emergency contacts should know what the hazards and emergency response procedures are.

2.2. Hazard pictograms

The purpose of this section is to give ‘at a glance’ information on the hazards associated with the work activity. These symbols can be found on the containers and Safety Data Sheets (SDS) (formerly Material Safety Data Sheets (MSDS)) of the chemicals involved. Tick all that apply.

2.3. Name of hazard

List all chemical hazards applicable to the work activity including substances used, produced, synthesised, created as waste or by products or released from processes. Provide the full name of the substance e.g. ethanol rather than EtOH. Further information on hazards can be found below under section 3.1.

2.4. Properties of hazard

This should be a brief description of how each chemical is hazardous such as ‘toxic’ or ‘flammable’. A more detailed description of the properties of the hazard should be given in section 3.2 of the COSHH form and this information will be used to inform how you will complete section 2.3. More information on properties of hazards is given below in section 3.2.

2.5. Emergency procedures

It is essential that all reasonably foreseeable accidents and incidents that result in exposure to or release of hazardous substances are prepared for in advance. Emergency and spillage procedures may be specified in standard operating procedures, which can be provided as an appendix to the COSHH risk assessment and referenced to. Appropriate training in emergency procedures should be provided. A copy of the risk assessment may be required by the emergency services and therefore should be easily retrievable in the event of an emergency. The accident, incident and near miss reporting form should be used to report such occurrences to OHSS who will record the information and follow up on the occurrence. To contact the emergency services call security on 6666, otherwise dial 999.

You may wish to group together hazards for which the same emergency procedures apply.

**Contained Spill**

For each hazard identified describe the response procedure for a contained spill or release. For example a small spill inside a fume hood. Spill kits should be readily available in laboratories and personnel should be trained in their use.
**Uncontained spill**
For each hazard identified describe the response procedure for an uncontained spill or release. For example a spill onto the floor of a laboratory. For a small uncontained spill the procedure may be the same as that for a contained spill. For a large spill further action may be required. In both cases decide whether it would be appropriate to use further PPE and to attempt to clean up the spill, to evacuate the building or to contact the emergency services.

**First aid**
Specify the appropriate first aid procedures following exposure to each of the hazards identified. The SDS is a good source of information. Work areas handling phenol must have an antidote such as polyethylene glycol (PEG) 300 available. Work areas handling hydrofluoric acid must have calcium gluconate and/or Hexafluorine solution available. Oxygen must be available for work involving cyanide. Diphtherine solution is an effective washing solution for many corrosive and irritating chemicals and should be considered. Specify whether emergency eye wash hoses and showers are required and available.

**Fire**
Specify how a fire involving the hazards identified will be tackled. Identify the appropriate types of fire extinguishers required for the given hazardous substances and ensure that these are available.

**Section 3: The Risk Assessment**
Sections 3.1 to 3.6 are designed to facilitate the assessment of multiple hazards on the same COSHH form. Additional rows can be added to the table as required.

3.1. **Name of hazard**
List all hazards applicable to the work activity including substances used, produced, synthesised, created as waste or by products or released from processes. Provide the full name of the substance e.g. ethanol rather than EtOH.

The term ‘hazard’ according to the COSHH regulations applies to a range of substances which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with, the skin, or other body membranes. Examples are;

- chemicals that are toxic, corrosive or irritants;
- carcinogens and mutagens;
- asthmagens and sensitizers;
- dusts, fumes, mists and vapours;
- asphyxiants;
- nanomaterials

Such substances may have been assigned a **Hazard (H) statement** between H300 and H373. Hazard statements are a standardised set of phrases that describe the hazards associated with chemical substances and mixtures and replace the more familiar Risk Phrases which will be phased out by 1st June 2015 (see info box 1).

Substances that are encompassed by the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) may also be included in a COSHH risk assessment if appropriate and in
many circumstances this will negate the need for two separate risk assessments. Such substances may be described as flammable, explosive or oxidising and may have been assigned a Hazard Statement between H200 and H272. Indeed, many chemicals are classified as both dangerous substances and substances hazardous to health, spanning both sets of regulations and it therefore sensible to consider their ‘DSEAR properties’ and their ‘COSHH properties’ in the same risk assessment. Note that subject to section 3.8 an additional short DSEAR risk assessment may be required.

3.2. Properties of hazard

Describe how the hazards used or produced during the work activity could cause harm. Safety Data Sheets (SDS) are a good source of information. The SDS for many substances can be obtained from the Sigma Aldrich MSDS Search and Product Safety Center. Indeed, all suppliers must provide these to meet their legal responsibilities.

**Hazard Statements**

It is recommended that the [Hazard statements](#) are provided for each substance listed (see info box 1), which can be found on the SDS. Include the complete statement and not just the H code on the COSHH form as this is more informative for other people who may need to read and understand the risk assessment. Other information provided on an SDS may also be useful for inclusion in the risk assessment.

**Workplace Exposure Limits**

Many substances that present an inhalation hazard have been assigned a Workplace Exposure Limit (WEL) which describes the maximum concentration of an airborne hazardous substance to which workers should be exposed. If applicable, the WEL for each substance must be stated in section 2.2 of the COSHH risk assessment. All substances that have been assigned a WEL are listed in the HSE document EH40. Such limits are averaged over a specified time period (8 hours for long term exposure and 15 minutes for short term exposure) referred to as a time weighted average (TWA). The long term exposure limit (LTEL) is intended to control chronic effects resulting from prolonged or accumulated exposure (e.g. lung or liver disorders), whilst the short term exposure limit (STEL) is intended to control acute effects that may be evident after only brief exposures (e.g. respiratory irritation and eye lacrimation). It is a requirement under COSHH that the WEL must not be exceeded and in any case risk of exposure should be reduced to as low as possible. Note that the absence of a substance from the list of WELs does not indicate that it is safe. For these substances, exposure should be controlled to a level to which people could be exposed, day after day at work, without any adverse health effects.
Info box 1

Chemical Classification

CHIP
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP) require chemical suppliers to give information on the hazardous properties of the chemicals they supply and to package them safely. The information they must give is supplied on the label and on a Safety Data Sheet (SDS). The standard description of a chemical’s hazards is by means of Risk Phases (e.g. R34, causes burns) and Indications of Danger (e.g. corrosive, oxidising etc.). Some indications of danger have sub categories (e.g. carcinogenic category 1, 2 and 3). Safety Phases (e.g. S39, wear eye/face protection) are given as an indication of precautionary measures required. Containers are labelled with orange pictograms such as the following, meaning harmful or irritant.

[Image of orange X]

This information is useful for identifying hazards and control measures when performing a COSHH risk assessment.

GHS/CLP
Across the world there are different laws on how to identify the hazardous properties of chemicals and how to pass this information on to users. The same chemical can have different descriptions in different countries. The United Nations has therefore developed a Globally Harmonised System (GHS) on classification and labelling of chemicals. The European Regulation on classification, labelling and packaging (CLP) adopts the GHS.

Under the new system Risk and Safety Phrases are replaced by Hazard Statements (e.g. H314, causes severe burns and eye damage) and Precautionary Statements (e.g. P280: Wear protective gloves/protective clothing/eye protection/face protection) respectively. Indications of Danger are replaced by Hazard Classes (e.g. category 1A, 1B and 2 carcinogens). Note that the Indications of Danger do not necessarily transpose directly to the new Hazard Classes for a given chemical. The CLP Regulation also introduces two new signal words ‘Danger’ and ‘Warning’. New pictograms have been introduced such as the following, which refers to health hazards such as skin irritancy/sensitisation.

[Image of exclamation point]

CLP is being introduced gradually and currently many suppliers are providing both sets of information on their SDS sheets. CLP compliant information will be the sole source of hazard information as of 1st June 2015.
3.3. Physical form

State the physical attributes of the hazardous substance used or produced, e.g. liquid, powder, granule, dust, gas, mist, fume etc. This may change during the course of the work activity. For example a substance may be obtained from the supplier as a powder, dissolved in water to make a solution and produced as a fume during the course of the experiment. More than one form may therefore need to be considered in the risk assessment for a given substance. If a less hazardous form of a substance is available, and suitable, then it is a requirement under COSHH to use it (see section 3: controls). Examples include substituting an easily inhalable powder for pellets or obtaining a solution at the desired concentration rather than buying the substance in a solid form that needs to be weighed out and dissolved. The latter would reduce the amount of handling required and the maximum concentration the worker would be exposed to.

3.4. Quantity and concentration

Indicating the quantity and concentration of each substance used allows consideration of the scale of the work activity and the level of exposure that could be anticipated. It will help to assess whether exposure is over the WEL for a WEL-assigned substance. Although not true for all substances in all circumstances, small quantities of dilute substances often present a lower risk of exposure than large quantities of concentrated substances. However, consideration should be given not only to the final concentration used in the work activity but also to the concentration of the substance as obtained from the supplier and any concentrated stocks or working solutions handled.

3.5. Frequency of use

Indicate how often the use of each substance listed will occur. Again, this allows consideration of the level and likelihood of exposure that can be anticipated.

3.6. Route of exposure

Identify all likely routes of exposure to ensure these are taken into account when selecting control measures. Substances may be harmful by one or more of the following routes;

- Inhalation
- Ingestion
- Absorption through the skin or mucus membranes
- Skin puncture

Consider the different forms of the substances identified in section 2.3 as different forms may represent different exposure routes.

3.7. Carcinogens.

Carcinogens are given special consideration under COSHH and must be substituted with a less toxic alternative where practicable. Under the COSHH regulations, a substance is regarded as a carcinogen if it meets one or more of the following criteria;

- It is categorised as category 1 or category 2 according to the CHIP regulations (see info box 1, page 6)
- It has been assigned the risk phrase R45 or R49 according to the CHIP regulations
• It is categorised as category 1A or category 1B according to the GHS/CLP regulations (see info box 1, page 6)
• It has been assigned the risk phrase H350 or H350i according to the GHS/CLP regulations
• It is listed under schedule 1 of COSHH
• It is listed as a carcinogen in document EH40

In addition, substances classified as group 1 or group 2A by the International Agency for Research on Cancer (IARC), even if they do not meet any of the above criteria, are also considered by OHSS as carcinogens. Users of carcinogens should notify OHSS using the forms at this link: http://www.ncl.ac.uk/ohss/chemical/carcinogens.htm. The notification will be used by occupational health to assess whether health surveillance is required. Further guidance on the identification of carcinogens, control of exposure and health surveillance can be found in the OHSS guidance document, University Guidance on the Use of Carcinogens.

3.8. Dangerous Substances and Explosive Atmospheres (DSEAR)

The purpose of this section is to prompt consideration of the hazards associated with chemical reactions, unstable or pyrophoric substances and explosive atmospheres. In these circumstances the controls required to protect health risks under COSHH my not be sufficient to control the fire and explosion risk. If any of these apply to the work activity then a short ‘add-on’ DSEAR risk assessment is required to satisfy the requirements of a risk assessment under the DSEAR regulations (see Appendix 1).

Thermal Runaway describes a reaction where an increase in temperature changes the conditions of the reaction in a way that leads to a further rapid increase in temperature. It is often associated with exothermic reactions. A runaway reaction can have a range of outcomes from the boiling over of the reaction mass, to large increases in temperature and pressure that lead to an explosion. Such violence can cause blast and missile damage. If flammable materials are released, fire or a secondary explosion may result. Further information on chemical reaction hazards can be found on the HSE website.

An explosive atmosphere is defined in DSEAR as ‘a mixture of dangerous substances with air, under atmospheric conditions, in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.’

3.9. Who might be at risk?

Specify who might be directly at risk of exposure to hazardous substances (e.g. laboratory staff and students) and who might be indirectly at risk (e.g. cleaning, security and maintenance staff). Other people sharing the workspace could be affected by the work and will need to be informed of the hazards and risks. This is of particular importance in multi user labs. Certain groups of people might be at increased risk such as new or expectant mothers, people who have pre-existing medical conditions (e.g. asthma, dermatitis, immunocompromised) or young people and will need to be given greater consideration in the risk assessment. Controls selected as a result should be sufficient to protect these groups. New or expectant mothers should read the University Pregnancy Policy and the Employee Pregnancy Booklet.
3.10. Assessment of inherent risk to health prior to the use of controls

The inherent risk of an activity is determined by a combination of the likelihood of harm occurring prior to the application of controls and the severity of harm should exposure occur, taking into account all of the information provided in section 2.

Risk = severity of harm X likelihood of harm = low, medium/low, medium, high

Consult the risk estimation matrix at the bottom of the form. This assessment is intended to inform the selection of suitable controls that are proportionate to the level of risk.

Section 4: Controls

The COSHH regulations state that the first consideration when selecting controls should be prevention of exposure. This is particularly pertinent for carcinogens, mutagens and asthmagens where the potential for long term and possibly fatal effects should be taken into account.

Prevention of exposure can be achieved by;

- eliminating the hazard;
- changing the process so that the hazard is not needed or generated;
- replacing the hazard with a safer alternative.

Where such measures are not reasonably practicable, control of exposure is the next best solution. Engineering controls are preferable over the use of personal protective equipment (PPE), which only protects the user and is dependent on the user earing it and using it correctly. However, it is appreciated that in many circumstances PPE is still necessary. When completing sections 3.1 to 3.4 of the risk assessment consider the Hierarchy of Hazard Control and the COSHH regulations’ Principles of Good Practice as described in Info box 2.

4.1. Physical or engineering controls

Work on the open bench with no further control measures may be acceptable for some substances that do not present an inhalation hazard or for work activities that do not generate inhalable aerosols. If this is not acceptable then engineering controls such as a fume hood, glove box or another type of local exhaust ventilation (LEV) may be required. Specify all engineering control measures required to undertake the work safely and describe when they will be used during the work activity and which hazard they will be used for. Remember to consider all hazards identified in section 2 and all parts of the work activity from opening the container to cleaning up and disposal of waste. It is a requirement that LEV systems are inspected and tested at least every 14 months.
**Info box 2**

**Hierarchy of Hazard Control**, with the most effective, most preferred methods at the top and the least effective, least preferred methods at the bottom.

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**COSHH’s Principals of Good Practice** (COSHH Schedule 2A)

- Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health.
- Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures.
- Control exposure by measures that are proportionate to the health risk.
- Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.
- Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment.
- Check and review regularly all elements of control measures for their continuing effectiveness.
- Inform and train all employees on the hazards and risks from the substances with which they work and the use of control measures developed to minimise the risks.
- Ensure that the introduction of control measures does not increase the overall risk to health and safety.

These must all be applied to achieve effective and reliable control

Further details of the Principals of Good Practice can be found on the [HSE website](https://www.hse.gov.uk).

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**4.2. Administrative controls**

Administrative controls may include, but are not limited to;

- training, instruction, supervision and competency testing – give details of training already received or required including local rules, training courses, safe working practices and standard operating procedures. Records of instruction or training should be kept. Personnel should be supervised until they have reached the desired level of competency to carry out the work activity. State any work activities that cannot be carried out without the approval of a supervisor or where direct supervision is required;
- signs and warning labels – describe any signage or warning labels required, bearing in mind that these are not necessarily a substitute for physical barriers;
- access control – restricting access to a small number of people will contribute towards reducing risk. If relevant, state how this is achieved.
For carcinogens and mutagens there is a specific requirement under the COSHH regulations to ‘clearly identify the areas in which exposure to carcinogens or mutagens may occur and [to] take measures to prevent the spread of contamination within and beyond these areas. The number of people likely to be exposed to carcinogenic or mutagenic substances and the duration of their exposure must be kept to the minimum necessary for the work. Non-essential personnel must be excluded.’

### 4.3. Personal Protective Equipment

Specify if any of the following are required for each hazard identified in section 2:

- **Hand protection** such as disposable or reusable gloves for substances that are corrosive, toxic or harmful when they contact the skin. Specify which material the gloves are made from ensuring that this material is compatible with the substances used (nitrile gloves are suitable for most, but not all chemicals). Cryogenic, thermal resistant or cut resistant gloves may be necessary for certain work activities.
- **Eye/face protection** such as safety spectacles, impact resistant spectacles or face shields, chemical resistant spectacles or face shields and UV protective spectacles or face shields.
- **Respiratory protective equipment (RPE)** such as disposable respirators, reusable half face and full face respirators and breathing apparatus. Disposable respirators or filtering face piece (FFP) masks only provide protection against particulates and fume, oil and water based mists. They are available in three classes, FFP1, FFP2 and FFP3 which reduce the amount of particulates inhaled by a factor of 4, 10 and 20 respectively. For protection against gases and vapours, reusable full or half face respirators fitted with suitable filters should be used. Selection of RPE should be appropriate to the hazards identified in section 2. RPE should be properly maintained and serviced and workers should be trained in its use and limitations. It is a requirement under COSHH that RPE (including disposable respirators) are face fit tested to the individual wearer by a competent person to ensure a tight and effective fit. Further guidance on the selection, use and maintenance of RPE can be found in the HSE publication, [Respiratory protective equipment at work](https://www.hse.gov.uk/).
- **Clothing** such as lab/Howie coats, overalls, aprons and safety shoes/boots. Lab coats are required to be worn as standard in all ‘chemistry’ and ‘biology’ type laboratories.

For all of the above state;

- when or for what part of the work activity the PPE will be used;
- the British standard (BS)/ European standard (EN) number if relevant

### 4.4. Storage requirements

State the storage requirements for each of the hazardous substances identified in section 2, paying attention to incompatible materials. For example, flammable materials should be stored separately from oxidisers, corrosives and toxic substances, in bins of fire-resisting construction. These bins should be designed to retain spills (110% of the largest vessel normally stored in it). The recommended maximum quantities that may be stored in one location (e.g. a laboratory) are 50 litres for extremely/highly flammable liquids (flashpoint below the maximum ambient temperature of the working area) and 250 litres for other flammable liquids (flashpoint of up to 55°C).
There is a specific requirement under COSHH to store carcinogens and mutagens safely and securely, including using closed and clearly labelled containers.

Other special requirements for storage such as time limits, temperatures, ventilation etc. should also be stated. It is recommended that hazardous substances are purchased in limited quantities to meet the needs of the work activity to avoid storing large quantities of a given substance for a prolonged amount of time. An annual audit of stored chemicals is recommended to remove unwanted or unused substances.

4.5 Transport of the hazardous substance

For internal transport describe how this will be done safely such as by the use of trolleys or winchester carriers. If travelling between buildings it may be prudent to carry a spill kit alongside the hazardous substance. For the external transport of hazardous substances there are complex legal requirements for packaging and labelling to adhere to and a dangerous goods approved courier must be used. The final package must be assessed and approved by an accredited Dangerous Goods Safety Advisor (DGSA) prior to shipment. A DGSA provided by the courier can perform this role.

4.6. Disposal procedures

Provide details of how each of the substances listed in section 2 will be disposed of when they are no longer required including where contracted specialist disposal is necessary. This is of particular importance for substances that have been assigned hazard statements H400-H413 (environmental hazards).

4.7. Is exposure monitoring required?

Exposure monitoring may be necessary if:

- the conclusions of the risk assessment suggest that exploratory monitoring is required to reach an informed judgement about the risks;
- failure or deterioration of the control measures could result in a serious health effect either due to the toxicity of the substance or the extent of exposure;
- there is reason to suspect that the WEL for a substance might be exceeded;
- a change in conditions means that adequate control of exposure is no longer being maintained e.g. an increase in quantity of a substance or a change in procedure;
- there is a need to check the effectiveness of the control measures.

Exposure monitoring should be carried out by a competent person using validated methods. In addition, oxygen and carbon dioxide monitors should be considered in areas where asphyxiant gases are used or stored. Contact OHSS for further assistance.

4.8. Is health surveillance required?

Detailed information on health surveillance can be found in the occupational health surveillance policy and programme but briefly, health surveillance may be required for those working with;

- carcinogens as described under ‘2.7. Carcinogens’;
- asthmagens, respiratory sensitisers and allergens (including, but not limited to, substances that have been assigned the hazard codes H317 or H314);
• other substances for which there is a likelihood that an identifiable disease or adverse health effect will result from, or may be related to, exposure.

The judgement as to whether health surveillance is required takes into account the quantity of the hazardous substance, the frequency of its use, the type of exposure and whether there is a reliance of PPE as a control measure. As described in section 2.7. the use of carcinogens should be registered using the following link: http://www.ncl.ac.uk/ohss/chemical/carcinogens.htm

Advice regarding Heath Surveillance can be obtained from Occupational Health

4.9. Assessment of residual risk to human health after the application of controls

Using the risk assessment matrix at the bottom of the form provide a final assessment of risk. If the assessment suggests that risk has been reduced to as low as reasonable practicable than work can commence. If not, then the risk assessment is not sufficient and additional control measures will need to be considered. Contact OHSS for advice. Be aware that it will not always be appropriate to describe risk as ‘low’ following the application of controls and some assessments may conclude the risk to be ‘medium’ or ‘medium/low’.

Section 5: Approval

The risk assessment should be signed by the assessor and by the PI/responsible person if he/she is not the assessor to confirm that they have reviewed and agreed the risk assessment. The PI/responsible person is responsible for ensuring that the risk assessment is viewed and understood by all personnel taking part in the work activity and is responsible for ensuring that the selected control measures are implemented and monitored.

A record of the COSHH risk assessment must be kept. A copy of the risk assessment should be available in the area where the work is done and should be easily retrievable for inspection.
Appendix 1: DSEAR Risk Assessment

Subject to section 3.8 of the COSHH risk assessment, a short DSEAR risk assessment may be required to allow consideration of the risk of fire or explosion. It is expected that for work activities that meet this requirement, further controls will be needed in addition to those required to reduce the health risks arising from the work activity. This DSEAR risk assessment is designed to accompany a COSHH risk assessment only and is not a full, stand-alone DSEAR risk assessment. A full DSEAR risk assessment is required if:

- the work activity involves the use or storage of pressurised flammable gas cylinders such as acetylene or hydrogen;
- very large quantities of flammable substances are involved, for where the recommended limits for storage of flammable substances are exceeded (50 litres for extremely or highly flammable substances and flammable liquids with a flashpoint below the maximum ambient temperature of the working area, 250 litres for other flammable liquids with a higher flashpoint of up to 55°C.);
- the work activity involves the use of explosives;
- the work activity is still likely to create an explosive atmosphere even when using the controls specified in the ‘add-on’ risk assessment;
- the work activity involves the use of flammable/oxidising/explosive substances only and not substances hazardous to health as defined by COSHH.

Section A: Risk

A.1. Risk of fire, explosion or energetic event

Describe how the activity can lead to fire, explosion or thermal runaway or cause an explosive atmosphere. Include any information on the chemistry and thermochemistry of a chemical reaction such as data that can predict the possibility of thermal decomposition, exothermic runaway or rates and quantities of heat and gas produced. This information can come from data in literature, calculations or tests such as isothermal calorimetry and adiabatic calorimetry. Consider the risk associated with all aspects of handling dangerous substances including:

- unavoidable releases such as dispensing;
- intentional releases from the work activity itself including substances produced as a result of the work activity;
- foreseeable releases such as leaks from equipment or storage containers or spillages.

A.2. Ignition sources

Identify all possible sources of ignitions in areas where the work activity is carried out and in storage areas.

Ensure that the information given in Section A is taken into account in the assessment of inherent risk in section 3.10 of the COSHH form.
Section B. Controls

B.1. What steps have been taken to control releases at source or reduce the quantity of the dangerous substance stored or used to a minimum?

Elimination or substitution of the dangerous substance or process must be considered first. However, it is accepted that the nature of the work may mean that this is not reasonably practicable. Therefore, measures to control or minimise release of dangerous substances must be employed. These can include but are not limited to:

- Carrying out chemical reactions on as small a scale as possible or carrying out small scale test reactions before attempting larger scale processes;
- Collecting, containing and removing any releases to a safe place (e.g. by ventilation);
- Avoiding adverse conditions such as exceeding the limits of temperature or other conditions that could lead to fire or explosion through process controls such as sensors, alarms and trips;
- Avoiding ignition sources;
- Following safe practices for storing and dispensing pyrophoric substances;
- Following safe practices for the use of solvents that can form explosive peroxides.

Further assistance in controlling chemical reaction hazards can be found in the HSE document ‘Chemical Reaction Hazards and the risk of thermal runaway’.

B.2. What steps have been taken to avoid releases that may lead to formation of explosive atmosphere under normal and accidental conditions?

If relevant to the work activity describe how an explosive atmosphere will be avoided. If risk of an explosive atmosphere cannot be avoided then a full DSEAR risk assessment should be carried out in consultation with the Fire Safety Advisor. The areas where hazardous explosive atmospheres are likely to occur should be identified and classified into zones based on their probability and persistence which requires a more in-depth risk assessment.

Ensure that the controls specified in Section B are taken into account in the assessment of residual risk in section 4.9 of the COSHH form.