



Swansea University  
Prifysgol Abertawe

# **SCHOOL OF THE ENVIRONMENT AND SOCIETY**

## **SAFETY HANDBOOK**

**Undergraduate, Postgraduate & Staff**

**NAME .....**

**REMEMBER:-**

- a) you must not undertake any task for which you have not performed a documented risk assessment**
- b) if you see a potentially dangerous situation it is your duty to report it immediately to an appropriate member of staff**

# SAFETY REMINDERS

Everyone should familiarise themselves with the location of nearest safety equipment as follows:

- a) **Fire extinguishers** - in corridors and some laboratories.
- b) **Break-glass Fire Alarm** call points - in each corridor.
- c) **First aid boxes** - in each laboratory and with each trained first aider. See list of first aiders on main notice board (Wallace Foyer).
- d) **Eyewash bottles with saline** - with first aid boxes.
- e) **Emergency Showers** - Wallace Building: lab 116 and basement corridor east end  
Margam Building: corridor near room 303

**Safety spectacles** must be worn by all personnel at all times in all laboratories except where or when indicated otherwise.

**Laboratory coats** suitably fastened must be worn by all personnel at all times in all laboratories, except where or when indicated otherwise.

**No eating or drinking is allowed in any laboratory at any time.**

**No smoking is allowed in any room or public area unless it is a designated smoking zone**

You are not allowed to start research work before completing the following forms: **SOTEAS Risk Assessment for Teaching, Administration and Research** and **SOTEAS Protocol Risk Assessment**. Forms must be signed by both yourself and the supervising member of academic staff.

No laboratory practical can commence before **SOTEAS Risk Assessment for Teaching, Administration and Research** and **SOTEAS Protocol Risk Assessment** forms have been completed, signed by the person running the practical and given to the module co-ordinator.

## Action in emergencies

### University emergency number - 333

- Unless you can immediately contact your Safety Adviser, call **333** on the internal telephone system, which connects you with the University exchange or the porters' desk in Fulton House day or night throughout the year.
- Do not call the public 999 service unless you fail to get a reply on 333 after a reasonable time.
- The emergency services report to the Fulton House desk and expect the duty porter to be able to direct them to the site of the trouble, so it is desirable that the person reporting the emergency does not use a mobile phone.
- State concisely the nature of the emergency and give an accurate location using officially recognised names or numbers.

Revised September 2009

## Working with this document

By the very nature of the diversity of activities within the School of the Environment and Society (SOTEAS), the range of safety measures under which we work is extensive. This main document thus seeks to give an overview of safety provision, with detail only on those aspects that are of importance to the majority.

Ignorance is no excuse when it comes to matters of safety. **It is thus beholden to the reader to consult those appendices that are, or may be, of relevance to their working practices within their University activities.**

### Definitions of work environments used in this document

**Office** – an environment containing hazards no different to those expected in any public-access area. No non-domestic chemicals, no non-domestic appliances or abnormal temperature regimes.

**Facility** – an environment similar to that designated as ‘Office’ but which is not open to the public. For example, IT facility, or map room. This environment at no time resembles that described by ‘Laboratory’. Special clothing is not required, though eating and drinking are still prohibited.

**Laboratory** – an environment containing, or potentially containing, chemicals and/or physical hazards (temperature, pressure, sound, electrical etc.). These areas require the wearing of special clothing (laboratory coats, closed shoes, safety spectacles). Eating and drinking are prohibited.

**Mixed environments** – some rooms may be multi-task. These must default to which ever is the more stringent of the above definitions. If their usage varies from day-to-day there must be a clear sign on the entry doors indicating the current role, e.g. ‘This room is currently an Office’ OR ‘This room is currently a Laboratory.’

**Field** – any external environment, terrestrial or aquatic. These should be treated with the same precautions as are Laboratories, requiring the wearing of appropriate safety clothing (waterproofs, thermals, life jackets). Eating or drinking must not take place concurrently with any research activity, nor in proximity of equipment or chemicals.

**Note that work outside of normal hours in *any* environment is discouraged and is not permitted in a laboratory or in the field unless a specific risk assessment has been undertaken and a sound case has been proposed and accepted.**

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# Introduction

Accidents happen only very rarely as the result of some unforeseeable mechanical failure or an unlikely coincidence of circumstances. Most accidents are caused by a combination of carelessness, lack of planning and inadequate knowledge. The majority of accidents could thus be prevented by remedying these failings.

The aim of all staff and students of the School is to:

- **prevent accidents**
- **minimise the effects if one nevertheless occurs**
- **subsequently eliminate the causes so that it cannot happen again**

As a contribution towards this, please read through this Handbook attentively and carry out all the procedures appropriate to your own work conscientiously. We would be glad to receive constructive comments at any time.

**The Safety Office website has additional information and electronic versions of various safety forms:- <http://www.swan.ac.uk/safety/>**

## Legal and other responsibilities

### Organisational Responsibility

The Vice Chancellor is responsible for safety within the University. The Head of School has overall responsibility for health and safety within the School. Individual members of staff are responsible to the Head of School for all aspects of safety of those activities and personnel they supervise.

The School of the Environment and Society (SOTEAS) Safety Adviser, in conjunction with the SOTEAS Health & Safety Committee, advises the Head of School on all matters affecting the health and safety at work of employees, students and visitors in the School.

The SOTEAS Health & Safety Committee receives minutes and reports from the University Safety Office and the Health and Safety at Work Committee and its sub-committees, and act as appropriate. For a list of **School Personnel involved in Health and Safety matters see page 28.**

A SOTEAS Safety Adviser and members of the School Health & Safety Committee carry out periodic housekeeping/safety tours of inspection of the School.

The implementation of safe working practices in individual laboratories lies with the academic supervisor(s) of that laboratory and its personnel. Anybody working in the School has a personal responsibility for the effects of their behaviour and practices on themselves and others.

**Accident report forms** are available from the main SOTEAS offices in Margam and Wallace Buildings. All accidents, fires and abnormal incidents must be reported to the School Safety Advisor, who will send the report to the University Safety Officer. If the accident results in personal injury, causing absence from work of three or more days, the details of the accident must be reported to the Health and Safety Executive by the University Safety Officer. This is a legal requirement. Safety Representatives have a legal right to be fully informed of the circumstances of all accidents and to investigate their cause.

Near misses **must** also be reported as they are important indicators of potential problems.

Under the Health & Safety at Work Act of 1974, it is the duty of every employee to take reasonable care for the health and safety both of themselves and of others who may be affected by their acts or

omissions; and also to comply with safety requirements regulating both their behaviour and the wearing or use of protective equipment.

Many people at Swansea University are not clearly in the position of either employer or employee, but the same principle applies: you are required to take as heavy a responsibility for your own health and safety, and that of those around you, as your degree of training and experience permits (see the University's "Statement of Safety Policy").

**Visitors** are not allowed in any non-public space within the School of the Environment and Society without the express permission of the Head of School unless accompanied at all times by a member of staff. Permission can only be granted on the understanding that the member of staff visited is responsible for the health and safety of the visitor while they are in the School, and that the required risk assessment forms have been completed for any work being undertaken.

## Responsibility for safety

The School of the Environment and Society follows, and complies with, the University Statement of Safety Policy. School working practices are designed to ensure, as far as is reasonably practicable, the health, safety and welfare at work of all its staff and students. The full support and active co-operation is required of all staff, students and visitors working in the School.

The **School of the Environment and Society** has a responsibility to:

- provide such information, instruction, training and supervision to provide safe and healthy working conditions, taking account of any statutory requirements;

- provide and maintain a working environment for School personnel that is safe, and as far as reasonably practicable, without risk to health in performing their work;

- make available any required safety devices and protective equipment;

**School Personnel** (staff, students and visitors) have a duty to:

- work safely and meet any statutory obligations;

- protect themselves and others from any hazards resulting from their work or behaviour;

- use the appropriate protective equipment provided;

- actively and proactively be involved in introducing measures to prevent any occurrence and/or recurrence of accidents.

The activities of the School are very varied, so there will also be a great variety of hazards; in certain instances, these may even be largely unknown. The best regulations may therefore not be sufficient to ensure total safety. We all have to rely on the alertness, common-sense and good judgement of those around us, as well as their knowledge and experience. It is a legal as well as a moral duty for all of us to treat the acquisition of safe habits as an integral part of education.

Authorised by Head of School (Professor M.A. Doel) ..... M. A. Doel ..... Date 8<sup>th</sup> September 2009

# Organisation for Safety

Swansea University employs a Safety Officer who will give advice or receive suggestions or complaints on Health & Safety matters. School personnel should first consult the School's Health and Safety Adviser (Dr J.E. Lancaster).

A list of specialised safety advisers within the School (e.g. for fieldwork, or use of radioisotopes, genetically modified organisms or pathogens) is given on page 27, with their locations and telephone numbers.

The Student Information Office, Room 030 Ground Floor, Margam Building keeps the official Accident Report, Hazard Report and **SOTEAS Risk Assessment for Teaching, Administration and Research** and **SOTEAS Protocol Risk Assessment** forms.

## Safety & Training Arrangements

### Undergraduate Student Safety and Training

Responsibility for health and safety in teaching laboratories is placed upon the person supervising the teaching activity within the laboratory.

Students will be presumed to be untrained in all matters of safety. Students will receive training, where appropriate, in the safe use of apparatus and equipment from academic and technical staff.

All equipment used by the student should be regularly inspected by a competent person.

Substances should not be introduced into practical work unless the hazards associated with them have been considered. The special precautions associated with carcinogens, mutagens, teratogens and biological hazards must be carefully evaluated and observed. **Where evidence is not available on the biological response, the substance shall be regarded as potentially dangerous and appropriate precautions shall be taken in its use and handling** (see COSHH assessment section).

Any instructions should highlight information on the potential hazards of the materials and equipment used.

Instructions are delivered in several ways:

- General notices in laboratories and corridors
- Safety instructions in practical class schedules
- Verbally by the person(s) supervising the teaching activity

Appropriate protective clothing must be worn at all times. **At all time, unless specifically indicated otherwise, laboratory coats and safety glasses must be worn in all undergraduate laboratories other than those specifically designed and operated as office-type environments (e.g. IT laboratories and map rooms).**

Undergraduate Students shall be trained in:

basic safety, i.e. general hazards likely to be encountered,

fire drills and emergency procedures,

laboratory safety,

VDU safety (Appendix 2)

and any additional appropriate skills as demanded by their activities, such as field work.

## Safety of Honours and Research Projects

NOTE – undergraduate students **must** undertake risk assessments and receive appropriate training **prior** to starting their project work. It is a condition of acceptance of the project report by the School that such risk assessments be appended to the project. This specifically includes risk assessments for the use of computers, in recognition of the risks presented by RSI.

The safety aspects of any project must be discussed by the student, supervisor and (if necessary) the appropriate Safety Adviser before work is started. Whenever a new project begins, or when any substantial change is introduced into an existing project, the formal risk assessment must be carried out. Note that this requirement applies to projects undertaken in any environment, and not just to those in laboratories or in the field.

### Graduate Student Safety and Training

Responsibility for health and safety in experimental research work is placed upon the person supervising the research. This is a legal duty of care and cannot be avoided, whether explicitly stated as here, or not. In any legal action, the Court will take into account all circumstances in apportioning the responsibility between the supervisor, the research student, the Head of School and the institution.

Research projects must not be undertaken without a **prior** assessment of the hazards associated with the processes and materials involved having been made. Discussion of, and the precautions to be taken against any perceived hazards must be agreed between the research supervisor and research student(s). Assessment of the hazards associated with any variation to work practice, experimental designs or any new materials introduced into the project must be undertaken before the work continues. Any additional or new hazards must therefore be discussed and agreed by the research supervisor and research student(s).

The recording of project hazard assessment must be recorded formally by the research supervisor and research student(s) on the **SOTEAS Risk Assessment for Teaching, Administration and Research Activities** and **SOTEAS Protocol Risk Assessment** forms. A copy should also be retained by both research supervisor and researcher with their own Safety File (see below).

Laboratory coats and safety spectacles must be worn in all research laboratories at all times unless a specific arrangement has been made otherwise with the authority of the Head of School.

The Head of School is, ultimately, responsible for ensuring that the **SOTEAS Risk Assessment for Teaching, Administration and Research Activities** is properly completed and signed for every activity within the School.

New postgraduates are required to attend training sessions on the use of fire extinguishers, which are held at the beginning of each academic year by the University Safety Office. Established personnel must refresh their knowledge (see safety training matrix on intranet).

Graduate Students shall also be trained in:

- basic safety, i.e. general hazards likely to be encountered,
- fire drills and emergency procedures,
- basic first aid,
- laboratory safety,
- VDU safety (Appendix 2)

and any additional appropriate skills as demanded by their activities, such as

- radiation protection
- laser safety
- gas cylinder safety
- hydrofluoric acid safety
- field work

## Staff Safety and Training

Staff have the major responsibility for their own safety in considering working methods, apparatus and materials, and in implementing all necessary safety requirements before proceeding with any work. It is the duty of all staff to obtain and disseminate the necessary safety information.

New members of staff are required to attend training sessions on the use of fire extinguishers which are held at the beginning of each academic year by the University Safety Office. Established personnel should refresh their knowledge (see safety training matrix on intranet).

Members of staff should be trained in:

- basic safety, i.e. general hazards likely to be encountered
- basic first aid
- fire drills and emergency procedures
- building evacuation procedures
- laboratory safety
- VDU safety (Appendix 2)

and any additional appropriate skills as demanded by their activities, such as

- radiation protection
- gas cylinder safety
- hydrofluoric acid safety
- field work

Staff are encouraged to attend the four-day (HSE approved) first aid course. There is also a useful one-day course.

**The safety training matrix is available on the intranet.** Click on “View Safety Office Records” for personal details of courses attended and then “Check the Training Schedule” for information about the frequency with which refresher courses are needed.

# Enforcement of Safety Standards within the School

As part of the HSE guidelines for safety we are required to have both:

- A monitoring system that works
- A documented mechanism for ensuring that standards are maintained.

The School uses the following mechanisms to enforce adherence to the regulations -

- 1) First infringement - **verbal warning** to the individual
- 2) Second infringement - **verbal warning** to the individual and to the member of staff responsible for the room (if required s/he will inform the supervisor of the individual)
- 3) Third infringement - **written warning** to the member of staff responsible for the room. This will be copied to the Head of School
- 4) Fourth infringement- a **ban** placed on the individual or **closure** of the laboratory for whatever period is deemed appropriate. This action will be taken by the Head of School.

Verbal warnings will be supported with warnings sent by e-mail if appropriate. Infringements are counted within a calendar month.

Note that the period between these warnings need be no longer than 24 hours and could, depending upon the problem, be of a shorter period. For example, an individual repeatedly failing to wear a laboratory coat and safety spectacles within a designated area could be banned within 24 hours.

If the infringement is severe then the process may start at level 3 or 4. An undergraduate student can be dismissed from a practical class after verbal warnings alone, though such an instance should be documented for future reference if required. If no individual can be identified as having caused a problem (e.g. chemicals spilt around a balance) then the individual will be deemed to be the member of staff responsible for the room.

Any warnings should be reported to the Chair of the Safety Committee who will document the events and pass on information to the Head of School, as required, for further action.

## General precautions in Offices

Although an office environment is often considered as being safe, there are numerous hazards that must be accounted for. Below are listed some examples; this is not exhaustive and the onus is on the individual to account for any risks that they may perceive in their particular work environment.

**Access** – ensure nothing blocks free access to escape routes. This includes coat stands and bags, as well as desks, chairs etc.

**Electrics** – ensure that electrical cabling does not obstruct free movement. Ideally, each item of equipment should be plugged into its own outlet. If fused flat extension multi-sockets are required you must check that their combined demand will not overload the extension. The use of two- or three-way adapters which plug direct into the socket is prohibited. Flexes should be regularly checked for wear and/or damage and be replaced by a competent person if needed.

**Computers** – ensure the positioning of these accords with current best practice to minimise the risk of RSI. All users of computers must have a risk assessment for their work environment.

**Photocopiers** – those who are routinely involved in operator-servicing (toner replacement etc.) must have a risk assessment for their work environment.

To guide you through the procedure there is a SOTEAS Office safety form (available from the School Main Offices) that should be posted on or near the main door of the room, and updated every 3 months.

## General precautions in Facilities

These are the same as for Office, as the environment is similar.

To guide those responsible for routine maintenance of facilities there is a SOTEAS Office safety form (available from the School Main Offices) that should be posted on or near the main door of the room, and updated every 3 months.

## General precautions in Laboratories

To guide those responsible for routine maintenance of laboratories there is a SOTEAS Laboratory Safety form (available from the School Main Offices) that should be posted on or near the main door of the room, and updated every 3 months.

The following are general guide lines that constitute Local Rules.

**Laboratory coats:** Undergraduate and postgraduate students are expected to provide themselves with a laboratory overall in an approved design and fabric, which should be worn properly fastened whenever they are in teaching or research laboratories. Laboratory coats must not be worn in other areas such as lecture theatres and seminar rooms.

**Eye protection:** Safety glasses are available from the outside company which supplies dissecting kits *etc.* early in the Christmas term.

**In all teaching and research laboratories, laboratory coats and appropriate eye protection must be worn at all times unless specific written instructions are given by the person in charge of the laboratory.**

Shoes must completely cover the feet and have non-slip soles. Unrestrained long hair, long ribbons, ties or scarves *etc.* are to be avoided. Ear protection, gloves or aprons will be provided where necessary and must be worn whenever this is required by notices or work-schedules.

**Behaviour:** Smoking, eating or drinking and the application of cosmetics are not permitted in laboratories. You should move through laboratories, workrooms and corridors, especially entrances or exits quietly and at a steady pace.

**Personal stereos and radios are not to be used in laboratories.**

**Safety Precautions and equipment:** In an unfamiliar laboratory, you should check the location of the fire-extinguisher, eyewash, water-spray or safety shower, first-aid box and any other special safety equipment. You should also establish which is the emergency exit. The printed schedule for any undergraduate experiment which offers special hazards will carry an appropriate warning and explanation. If you don't fully understand the schedule instructions, ask. If a particular form of protection (such as an eye-shield or gloves) is provided, you must use it. If it is mentioned but not provided, insist that you are given it before proceeding. If you feel that there is insufficient explanation of hazards or inadequate provision of safety equipment, this should be brought to the attention either of the person in charge or the appropriate Safety Adviser.

**'Good housekeeping':** Conducting your work in a tidy and well-organised way makes a major contribution to the safety of both yourself and your fellow-workers. A bench should be clear of any apparatus or materials not needed for the work in hand. Plan the layout of your equipment, ensuring that cables and tubing run where they cannot be damaged and do not obstruct or trip passers-by, that sources of heat can rapidly be removed or turned off, and that tubing discharging water into a sink or drain cannot easily be moved. Do not obstruct walkways. **Do not use laboratories as throughways** when alternative routes (corridors) are available. All containers of reagents or working solutions should be clearly labelled to show both the nature of their contents and any associated hazards - flammable, corrosive, poisonous *etc.* Clean up spillages and dispose of waste immediately (see appropriate section of handbook). Dispose of broken glass or other hazardous waste in the appropriate receptacle, label danger-points in your apparatus and shield them appropriately.

**Bench storage of chemicals.** Store all chemicals out of direct sunlight. It is bad practice to keep bottles of any chemicals, but especially liquids, in direct sunlight. Very sharp increases in temperature of the contents can take place. Beware of the lens effect of liquids in spherical glass containers. The sun focused through a flask of liquid placed on a window-ledge can start a fire. Store large bottles of chemicals where they can easily be reached and lifted. Keep only as much of a flammable or otherwise hazardous chemical as is needed for immediate use - 500 ml is the upper permitted limit.

**Carrying chemicals and equipment.** Do not carry bottles by their necks; use a carrier. Beware of injury to others or damage to equipment by collision, especially when emerging from a doorway. Use a tray or trolley in preference to overloading your person. **Winchester bottles must always be carried in Winchester carriers.**

**Heating liquids.** When heating liquids in a tube use "bumping beads" and ensure that the mouth of the tube is not pointing in the direction of yourself or others.

**Identifying chemicals.** Never taste or sniff an unknown chemical.

**Dissolving and diluting.** Strong acids and alkalis often generate considerable heat when mixed with water: always add the concentrate to the water, a little at a time, preferably over a sink or in a wash-down fume cupboard.

**Pipetting.** Never pipette by mouth; always use a safety pump or bulb. Even when the liquid you are using is innocuous, you risk contamination from the mouthpiece or fingers.

**Refrigerators.** Domestic models spark when opened. Substances giving off flammable vapour must only be stored in properly protected refrigerators.

**Bunsen-burner flames.** Remember that the transparent blue flame (when the air-inlet is open) is invisible in bright light; always close down to a luminous yellow flame when not in use but still required.

**Do not use Latex rubber gloves in the vicinity of a naked flame as they ignite at low temperatures.**

## Special Precautions in Laboratories

These are described in the following appendices

**Appendix 4: Chemical and Physico-chemical hazards** –This appendix covers work involving hazards associated with chemicals, gases, pressure, temperature and cryogenics, centrifuges and UV light.

**Appendix 5: Use of Hydrofluoric Acid**

**Appendix 6: Use of Radioisotopes**

**Appendix 7: Genetic Manipulation and Genetic Modification**

Genetic modification in relation to an organism means the altering of the genetic material in that organism by a way that does not occur naturally by mating or by natural recombination or by both. The genetic manipulation work permitted in the School of the Environment and Society under the Genetically Modified Organisms (Contained Use) Regulations is set out in the relevant project descriptions approved by the Genetic Manipulation Safety Committee (available from the Genetic Manipulation Biological Safety Advisor). **Detailed and specific guidance on those activities defined as genetic modification in relation to the regulations are given in Appendix 7 and the Regulations and Guidance Notes** (available from the Genetic Manipulation Biological Safety Advisor).

## Precautions during Field Work – see Appendix 8

Fieldwork is defined as any practical work involving teaching or research which takes place outside the Campus buildings. Voluntary and leisure activities are not included. All Health and Safety Acts and Regulations apply to Fieldwork, just as they do to activities on the Campus. In addition, there is the civil law of negligence whereby a person or organisation may sue another where there has been a failure to prevent a foreseeable or preventable accident. The nature of Fieldwork in the School varies widely from Urban 'Fieldwork' to Fieldwork on ice-covered mountains, and work at sea.

The regulations governing safety in the field are extensive and are described in Appendix 8. All participants on field courses must be prepared to complete a brief medical questionnaire and to sign a declaration that they have read and understood these safety regulations.

All fieldwork is potentially hazardous, and careless or irresponsible behaviour can lead to serious injury or death. Any person who is considered to pose a risk to their own or the group's safety may be excluded from further fieldwork activities and/or dismissed from a field course.

No work can proceed without completion of appropriate **SOTEAS Protocol Risk Assessment** forms.

## Assessment and Control of Risks to Health\*

(including **COSHH** - CONTROL of **SUBSTANCES HAZARDOUS** to **HEALTH**)

The central plank of safety is risk assessment and alleviation. In order to ensure that risks are properly considered, all work activities within the School are subjected to risk assessments documented upon the **SOTEAS COSHH Assessment of Protocol** form. These forms are held within **Safety Files** (see below) and available on the SOTEAS safety web site.

For a given environment, there are established methods of ensuring that risks to health are adequately controlled. The method adopted must always ensure that activities are carried out using levels of management or containment which are adequate to control risks to health for all who might be exposed (including those outside the immediate working area).

Risks to health should be assessed as a function of both the health hazards presented by the substances involved and the exposure inherent in the activities employed within the environment.

Where elimination or substitution of the hazard is not practicable for a given activity, the recommended approach to the control of risk depends on the restriction of the number of persons potentially exposed at any one time and the use of an appropriate level of containment selected from a limited number of options. Such a selection procedure involves an initial listing of activities and consideration of the hazards and exposures associated with them using the **SOTEAS COSHH Assessment of Protocol** form. The associated risks can then be assessed and appropriate measures selected to control them. For a more detailed consideration of hazard assessment see Appendix 2.

Former risk assessment forms have now been superseded (see below). **Please note, however, that these forms must be retained.** All activities starting, or continuing, from 1<sup>st</sup> October 2009 must operate under the new scheme. (See Risk Assessment Procedure in SOTEAS, below).

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\* **COSHH ASSESSMENT** - extracts taken from "COSHH in Laboratories" published by the Royal Society of Chemistry, July 1989

# Safety File

All staff and Postgraduates must keep a file containing:

- The latest copy of the **SOTEAS Safety Handbook**
- Their copy of **SOTEAS Risk Assessment for Teaching, Administration and Research Activities**
- Their copies of their **SOTEAS Protocol Risk Assessment** forms
- Copies of **Manufacturer's Safety Data Sheets (MSDS)** for the chemicals of hazard categories A and B in their protocols
- SOTEAS safety notices and memos

The file should be kept wherever you are working and it should always be available for inspection.

## Risk Assessment Procedure in the School of the Environment & Society

1. The **SOTEAS Risk Assessment for Teaching, Administration and Research Activities Summary** form (available electronically from the main School Offices) documents the name of the worker and their supervisor, together with the dates, signatures, title and base location of the activity. Attendance at safety courses (e.g. use of fire extinguisher) should be recorded on this form. There is also a table for documenting the assessment date, frequency of re-assessment, **hazard category** (i.e. **A,B,C,D**), the containment level (i.e. **SA,FC,OB**) and exposure potential (i.e. **H,M,L**) copied from the protocol sheets. This is important as a monitoring process. **No activity may be undertaken without due regard to the restrictions placed on work as covered by local rules on gene manipulation, the use of radioisotopes or by the Animals (Scientific Procedures) Act.**
2. **SOTEAS Protocol Risk Assessment** forms (Protocol forms) are also obtained from the School Main Offices either as hard copy or on disc, or they may be downloaded from the SOTEAS safety web site. A separate one must be completed for each protocol. Complex projects should be broken down into appropriate smaller protocols. Please note that these forms contain sections for non-chemical hazards and must be completed even if no chemical is involved (e.g. computer use, bird-watching). If the electronic version is being used then sections can be expanded or reduced as required (see Appendix 1).
3. When a protocol has been assessed then it must be approved by the supervisor of the protocol. **Technicians** have the protocols assessed and signed by the academic supervising the research or teaching activity. **Undergraduates** have their assessments for projects signed by their supervisors. **Academic members** of staff need not have the Head of School's signature as they are regarded as research competent for all the activities they undertake.
4. When completed the form(s) are attached to the **SOTEAS Risk Assessment for Teaching, Administration and Research Activities Summary** form along with the **Manufacturer's Safety Data Sheets (MSDS)** for each of the chemicals involved that constitute a hazard category A or B. Copies of the front page and protocols are made and retained by the supervisor and the originals retained by the student. At the end of the activity the supervisor's copy will be deposited in the worker's record file.
5. The hazard assessment must be made before any practical work is undertaken. It is the responsibility of the supervisor to ensure that this procedure is followed. A **SOTEAS Risk Assessment for Teaching, Administration and Research Activities Summary** form and **Protocol** form(s) **must be completed even if the activity is not considered to involve any obvious hazards.**
6. The **Protocol** form(s) must be updated at appropriate intervals and **every** time there is a significant change in the activity working procedures. Again the responsibility for recording changes to the risk assessment lies with the academic supervisor.

## Disclosure of medical conditions

All students and staff have a duty a duty to disclose conditions that might adversely affect the safety of themselves or others. They should consult Occupational Health for advice.

## Working out of hours

Normal working hours, Monday to Friday, extend from 8.00 a.m. to 6.00 p.m. (end of practical classes) but people are around in greater numbers between 9.00 a.m. and 5.00 p.m. Porters, cleaners and other staff may be present earlier and later on weekdays or during Saturday mornings. However, you cannot rely on their presence or their ability to deal with emergencies requiring special knowledge. For your own protection, if you wish to enter or remain in any building under the control of the School outside the period 8.00 am - 6.00 p.m. weekdays (except for time-tabled teaching, seminars or other special meetings) or at any time over the week-end, and your staff/student card does not allow such access you must obtain authorisation from the Head of School/Department or the School Safety Advisor or authorised deputy and get your card re-programmed by the appropriate technician. Such permission may impose restrictions, designed to reduce the risks of out-of-hours working, which you must strictly observe. It must be recorded on your **SOTEAS Protocol Risk Assessment** form. You must be prepared to show this authority and proof of identity if required.

If you are carrying out work in a laboratory or field environment you must also ensure that someone capable of coming to your assistance, if necessary, is within ready call (in most cases, within the same room). It is forbidden to do practical work alone, unless written authority is provided by your supervisor. Undergraduates should on no account work in laboratories after normal hours unless there is another competent person in an adjacent area. When such a person leaves the building any colleagues should be informed.

All persons working in any part of School buildings after 6.00 p.m. during week days, and between 6.00 p.m. Friday and 8.30 a.m. Monday, will be required to complete the signing-in book (situated on the porter's desk) when they enter and leave. The book will be the first point of reference in the event of an emergency and will permit suitable action to be taken to account for all personnel

## Sexual/Racial Harassment

Safety hazards are not restricted to chemical or physical ones, but include those posed by other members of the University or the public associated with sexual and/or racial harassment.

Any member of the Sexual/Racial Harassment First-Contact Network may be approached for confidential advice. The members are representative of University Faculties, Trades Unions, the Student Union, the Occupational Health Service and the Human Resources Department. Further details may be obtained by consulting the University's Code of Practice on Sexual and Racial Harassment, copies of which may be obtained from the Human Resources Department.

**The following Booklets are available from the Human Resources Department.**

- Misuse of Drugs and Alcohol: Code of Practice.
- Policy Statement on Occupational Stress.
- Code of Conduct on Personal Relationships.
- Race Relations and you.

## Hazard reporting

If you become aware of a situation which could lead to injury or otherwise threatens health, or poses a serious threat of explosion, fire, flood or other damage, you should report it immediately to your Safety Adviser. Don't be afraid of seeming silly or officious; excessive caution is preferable to a casual or over-confident attitude. Do not suppress mention of stupid or careless behaviour by your colleagues out of loyalty - you may end up as the injured one!

## Personal injury

Any injury, no matter how slight, which is sustained during the course of your work or studies must be reported. If the injured person is able to move without making matters worse, they should seek attention at the University's Occupational Health Centre (temporarily located in grey portacabins situated between Preselli and Cefn Bryn Halls of Residence) which is open 8.30 a.m. - 4.30 p.m. weekdays. The Casualty Department at Singleton Hospital, to the west of the campus, is open 8 a.m. - 6 p.m. every day (but is unable to deal with incidents requiring X-rays such as fractures etc.). If there is the slightest doubt about moving the patient, see the nearest Safety Adviser (listed at the end of this Handbook) or a First Aider (listed on the main notice board, Wallace Foyer), call the Occupational Health Centre (tel. 5538) or (in case of any difficulty) 333, giving a clear but short account of the problem. An Accident Report Form (available from the School Main Offices or your Safety Adviser) should be completed as soon as practicable after an injury has been sustained.

## To the rescue .....

If you see someone collapsed in a laboratory, office or workroom, you may want to go to their assistance; you should, however, briefly consider the possible cause of their condition before you rush in to help. You should always summon help before you attempt to do anything else. If the person has succumbed to asphyxiation by an inert gas, intoxication by a poisonous vapour, electrocution or maybe even attack by a venomous animal, you could be putting yourself at risk. You should not attempt anything unless it is quite clear that you will be able to safely neutralise the hazard. At least use a life-line, firmly attached and tended by another helper who remains outside the danger area. If you are in any doubt, call the Fire Service (via the University's emergency number 333) who have special breathing apparatus and other rescue equipment. You should observe the same caution in the field before you attempt the rescue of someone injured by falling rocks, road or rail vehicles, having difficulty in heavy seas or strong currents, or caught up in any other generally hazardous situation. No-one is helped by the death of a would-be rescuer.

## Fire

Your first duty on entering new accommodation, whether a laboratory or residential setting (e.g. fieldtrip) is to ensure knowledge of emergency exit routes

As soon as any fire is detected, call for help by breaking the glass of the nearest fire-alarm with any available hard object (the heel of a shoe, if nothing else comes to hand) - the sirens will sound either immediately or after a short delay if smoke-detectors are fitted in the building. At the nearest safe point, call 333 and report. The Fire Brigade will normally arrive within 4 minutes. Leave the room with its doors and windows closed and any forced ventilation turned off. Make sure that no-one remains in the room and no-one can approach the site of the fire until the area has been declared safe by the fire brigade.

When you hear an alarm sounding continuously, stop whatever you are doing, pausing only to put apparatus or machinery into a safe state if this can be done quickly. Check that everyone in your room has heard the alarm and leave, closing doors behind you. Take the nearest safe exit and assemble at the point specified on the fire notice nearest your room (you should already be familiar with its instructions - if not, go and read it now). Make sure that your colleagues there know that you have safely evacuated the building. Do not return before the Fire or Safety Officer in charge declares it safe to do so. Remember that if you are thought to be still in the building, or return to it before it is safe, fire-fighters may be forced to risk their own lives trying to locate and rescue you.

## Handling wheelchair users in the event of a fire alarm

If you are the responsible person in charge of a class, tutorial etc. when the fire alarm sounds, and you have in your charge a wheelchair user and there is not level access, the procedure to follow is to establish whether the alarm is false, practice or genuine.

1. In the case of a false or practice alarm, the wheelchair user should be escorted to a safe room, preferably near the top of a stairwell, and you should stay with the person until the alarm is over. It is very important to inform someone (ideally the fire warden for the area) who will in turn inform the porters and/or the fire brigade of the situation.
2. You should adopt the above procedure if you do not know if the alarm is genuine and cannot smell or hear any signs of fire.
3. If you detect signs of fire, the wheel chair user should be removed to safety by the use of the special 'Evac Chair' located in the ground floor foyer. Training is available in the SDU. Members of staff are encouraged to attend this course, especially if they routinely have a wheel chair user in their class.
4. Some wheelchair users cannot be evacuated by the 'Evac Chair' through reasons of their specific disability. If you detect signs of a fire, then the wheel chair user should be removed to a room as far removed from the source of the fire as possible as in 1. above. It is most important that the fire brigade be informed of the situation as soon as possible.

***The fire-alarm system is checked regularly, resulting in a brief sounding of the alarm sirens.***

## Extinguishing different kinds of fire

### 1. Wood, paper, cloth, plastics, rubber

Use **water** from an extinguisher, hose-reel or bucket (hose-reel gives the best control and longest duration) unless live electrical equipment is involved. Carbon dioxide, organic vapour (BCF etc.) and powder extinguishers or sand from a bucket can be used on small, surface fires. BCF is not recommended in confined spaces, where the vapour may cause asphyxiation.

### 2. Flammable liquids

Use **dry powder** if widespread or in an open situation, foam in confined spaces (directing it into back of fire and working towards you) or **fire-blanket** if in a container. Carbon dioxide or BCF are effective on small fires but beware of re-ignition. **Do not** use water in a jet; it will spread the burning liquid. The **fine-spray water extinguisher** is effective.

### 3. Electrical equipment

**Switch off power** (but note that capacitors can still discharge). Use **carbon dioxide** or **BCF**. **Do not** use water or foam, which conduct electrical current. Dry powder is effective but will ruin delicate equipment.

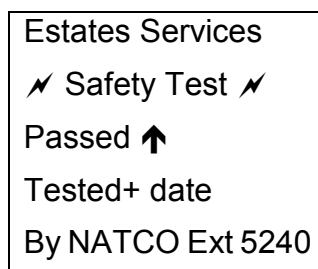
### 4. Clothing

Use a **fine-spray water extinguisher**, paying particular attention to protecting the head and neck, or wrap the subject in a **fire-blanket**, getting him/her into a lying-down position as quickly as possible (the blanket may otherwise act as a duct, concentrating flames on the head and neck). Aimless **running around** will fan the flames, not extinguish them (it might be worth running to a safety shower if one is nearby).

**Carbon dioxide** is the best general-purpose extinguisher for any fire which you can safely tackle alone. Remember that most hand-held extinguishers will empty themselves within 60 seconds, after which the fire may re-ignite, so do your best to arrange a back-up supply.

## Electrical Equipment

Only appliances obtained from commercial suppliers or purpose-made by a competent technician may be connected to mains outlets in School facilities. Under normal circumstances, plugs should be attached only by the electronics workshop technician. The outer covering of the flex must pass into the plug, where it should be firmly fixed: if the colours of the inner wires can be seen, the plug has been improperly fitted and must be repaired before use. Every item of authorised electrical equipment should carry a grey label, wrapped around the plug end of its flex, showing the date and result of a safety test. The label has the following information:-



Equipment bearing this green label is safe to use. If there is any doubt as to the safety of electrical apparatus, it should not be used and the appropriate person informed (i.e. the person in charge of the laboratory or the electronics technician). Any equipment without a label or bearing a red label must not be used: it should either be repaired (and re-tested) or scrapped. In wet conditions, particularly in the presence of seawater, as little as 20v or 20mA can be dangerous. Don't switch on remote equipment if you can't see that it will operate safely.

Ideally, each item of equipment should be plugged into its own outlet. If fused flat extension multi-sockets are required you must check that their combined demand will not overload the extension. The use of two- or three-way adapters which plug direct into the socket is prohibited. Flexes should be regularly checked for wear and/or damage and be replaced by a competent person if needed.

### High voltage

Where bench work with high voltage equipment is necessary ensure that you are familiar with the equipment. Ascertain that the equipment is disconnected from the mains when setting up and dismantling. **Electrophoresis equipment is potentially lethal.**

### Noise

Noise can cause damage to the hearing, reduce efficiency or merely annoy. Damage to hearing can result from a sudden violent sound producing an effect as dramatic as the rupture of an ear drum. Continuous exposure to lower noise levels can, however, produce deafness. In the latter case, the impairment to hearing may pass unrecognised for a long period due to the insidiousness of the effect.

The effect of noise on hearing varies with the frequency band in which the sound is being emitted, but chronic exposure to sound intensities 100 dB above the datum intensity corresponding to a root mean square sound pressure of 0.0002 dynes/cm<sup>2</sup> may have an adverse effect on hearing.

Where ear protection is necessary, e.g. during prolonged use of an ultra-sonication probe, ear defenders are preferable to ear plugs. Do NOT otherwise wear anything (e.g. headphones) that may prevent you from hearing an alarm.

If you suspect noise is a problem, the University Safety Advisor will check the noise level for you.

## Cold-rooms

Check that the inner handle releases the door catch before closing yourself in. Constant-temperature rooms all lack ventilation; do not release toxic vapours or asphyxiating gases (such as nitrogen or carbon dioxide). They are meant as work-rooms; do not clutter them with material in long-term storage. Wear warm clothing if you expect to be working in a cold-room for some time - chilling makes you careless and clumsy.

## Fume Cupboards

It is essential that certain procedures are adhered to so that the fume cupboards can operate as designed and therefore comply with all the current legislation.

1. Whenever a fume cupboard is used it will be necessary for the person responsible for that cupboard (either a technician or member of staff etc) to assess the hazards associated with the materials to be manipulated to ensure that the fume cupboard is satisfactory for its intended purpose and that current exposure limits for toxic substances are not exceeded
2. All spillages must be wiped up and/or washed down as soon as they occur.
3. No equipment or chemicals are to be stored in a fume cupboard, they should be removed after use and replaced in their normal storage location (i.e. the ventilated cupboard under the unit). Equipment and objects within the fume cupboard reduce air-flow, and the effectiveness of the fume cupboard is reduced. Be aware that even the user can cause the air flow to be disturbed.
4. No loose materials such as paper, polythene bags or rubber gloves should be left in the chamber in case they are sucked into the duct and cause a blockage.
5. The sash-stops should be kept in the locked position so that sash opening is maintained at, or below, the maximum set height when the fume cupboard is in use. The fume cupboard must **not be** operated with the sash in the fully open position as the air flow is too low.
6. All internal and external surfaces must be periodically cleaned down in line with the manufacturer's recommendations.
7. A current test certificate must be attached to the front of the cabinet at all times. This certificate will be updated at the prescribed times by contractors through the Estates Department. Any queries regarding this or any other operational matter should be referred to this department on ext. 5240, or in regard to any safety query the Safety Office on ext. 5150.
8. Any faults, alarms or problems must be reported to the person in charge, in the first instance, to limit duplication of calls. If such a person is not available, the cupboard should be locked off at the key switch until the problem can be attended to.
9. At certain times, maintenance and testing of fume cupboards needs to be carried out, and also access to the roof may be required. On these occasions the fume cupboard must not be used and the fan must be switched off. Notices will indicate this.

## Unattended apparatus

Anyone using a laboratory or workshop has a responsibility to leave equipment in a safe state. The rule, which all should observe, is to turn it off if in doubt. Thus if you intend that equipment should operate outside normal working hours, it must be labelled with the appropriate card, also indicating where or how to shut it off if anything goes wrong. This can be obtained from your Safety Adviser and is not valid without their signature. The appropriate light-switch should be indicated with a red adhesive disc or the equipment connected with a red (or red-painted) electrical plug.

## Dealing with wastes and spillages

In undergraduate laboratories, instructions are given and clearly- marked containers provided for dealing with the types of hazardous waste arising from a particular series of experiments. Please observe these carefully. Spills and breakages will be dealt with by the demonstrators, technical or teaching staff, who will also advise on the disposal of any materials for which provision has not already been made.

Broken glass and other sharp or pointed objects are collected in a separate, clearly marked box within each major work-area; do not include them with other rubbish. Unwanted chemicals, other hazardous solid wastes, toxic substances in solution and flammable or water-immiscible liquids should be placed separately in clearly labelled, sealed containers and passed to the appropriate technician (consult your Safety Adviser) for documentation and disposal.

Dilute acid or alkaline solutions, also aqueous solutions of inorganic salts and organic compounds which are not highly reactive, corrosive or toxic, may be flushed down a sink with copious amounts of water. Do not mix solutions - flush them away one at a time. In laboratories with open gullies or multiple sinks, use the sink or drain furthest downstream. Concentrated solutions, and any about which you have doubts, should be passed to the technician responsible for waste disposal.

In research laboratories, the proper treatment of spillages and the disposal of wastes arising from the use of particular substances ought to be amongst the topics discussed and procedures agreed when preparing the required initial safety assessment.

Please note that spills of water and other liquids which are not chemically hazardous nevertheless greatly increase the risk of slipping on polished floors; they should be mopped up immediately.

## Biological wastes

Almost every major group of organisms contains a few representatives which present risks of infection, infestation, poisoning or mechanical injury. It is the duty of the worker and/or their supervisor to identify the hazard and provide suitable protection against it, for those not involved in the work as well as themselves. When handling vertebrates, it is important to remember that even an apparently trivial bite or scratch can readily become seriously infected (leading, in the worst cases, to potentially fatal diseases for which there is no certain cure). It is also possible to experience problems from allergic reactions to a wide variety of organisms, biological fluids, extracts or products. It is good practice to wear protective clothing (including gloves, face-mask to avoid inhalation of particles, and visor or goggles to protect from splashing or spraying, as appropriate), removing these items and washing thoroughly before entering public areas. If you experience a blocked or running nose, watering eyes, itching, a skin-rash or breathing problems during or after exposure to animals or other biological materials, seek advice from the Occupational Health and Emergency Centre. Experimental work with vertebrates or cephalopods requires Home Office licences and approval from the Ethical Subcommittee of the University's Animal Facilities Committee. Any approved experimental work must be carried out only in approved locations. At present there are no licensed facilities for carrying out this work at Swansea. Licence holders have to successfully complete mandatory training courses (held in Cardiff) and are required to be monitored by the University's Occupational Health personnel on a regular basis.

Small quantities of uninfected and unobjectionable wastes of plant or animal origin should be sealed in opaque plastic bags for disposal in the paladins kept opposite the west entrance to the Margam Building. Larger quantities of uninfected plant material may be passed to the Botany Gardens staff for burning or composting. Marine remains become objectionable quite quickly and are often associated with quantities of rock, shells or sediment. Those who collect such material are responsible for disposing of it. If it cannot be returned to the site of collection, waste material should be sealed in bags and passed to the appropriate technician for disposal at an approved local authority site; such waste must not be allowed to putrefy but should be frozen until it can be discarded.

## Pathogens and infected wastes

Microbial and fungal cultures, and infected animal material in small quantities, are bagged, autoclaved and then disposed of as rubbish in the paladins. Autoclave bags bearing warnings implying hazardous, infected or contaminated contents may be used only for this purpose and, before disposal, must themselves be sealed within opaque bags so that the warning is not visible. Contaminated sharps should be placed in the special containers provided ("Cinbin" or similar product) for subsequent incineration. Infected plant material or soil must be sterilised before appropriate disposal.

## Radioactive waste

Disposal of radioactive materials is controlled under the overall supervision of the University's Radiation Protection Advisor and procedures are described in the SOTEAS Code of Practice for Use of Ionizing Radiation (Appendix 4).

## Disposal of Waste Solvents via the Chemistry Department Waste Store (Grove Building)

- 1) Waste solvents must be kept separately as either "halogenated" or "non-halogenated" and placed in appropriately labelled **fail-safe** glass winchester bottles. These bottles and/or labels can be provided by the waste store technician in the Chemistry Department.
- 2) For safety reasons the bottle must only be filled to  $\frac{3}{4}$  capacity. The bottle should be taken to the ground floor stores at the back of the Grove building and given to the technician.
- 3) The bottle should have a stick-on label attached which gives the following information:
  - a) name of the person disposing of the waste
  - b) laboratory of origin
  - c) date
- 4) The store-person will exchange an empty container for the one being handed in.

**The storekeeper has been instructed to refuse to accept waste from people not complying with these instructions. If you are in any doubt, please contact the appropriate person prior to moving the material.**

In addition, if your waste solvents have an aqueous phase they should be treated as

- a) waste chemicals to be disposed of via the Safety Office (**small amounts**)
- or
- b) the solvent phase should be separated for disposal via Chemistry and the aqueous phase via the Safety office (**larger volumes**)

## Disposal of Other Chemicals

Other chemicals can be disposed of by arrangement with the University Safety Office following completion of the requisite forms. The chemicals must be securely packaged and fully labelled before the Safety Office will accept them.

## Disposal of IT equipment

IT equipment, including rechargeable batteries, screens etc. must not be disposed of with domestic waste. Please contact the School IT support personnel who will arrange for proper disposal.

## Appendix 1

# Guidance for Completion of SOTEAS Protocol Risk Assessment Form

**Protocol** - any self-contained procedure. This could be any activities undertaken from lab-work, use of equipment, fieldwork and office work. Your complete research/teaching **activity** (e.g. undergraduate project, PhD study, research grant) is therefore made up from separate **protocols**. If the protocol is mainly of low hazard, but with one or more hazardous components, consider making the manipulation of the latter a separate protocol and tie them together by completing the “*Associated Protocol*” box. This is because the entire protocol must be conducted under conditions required for the handling of the most hazardous chemical.

**Title/Description** - give sufficient detail to make it obvious what the protocol involves.

**Chemicals etc.** - give name, maximum quantity used, list hazards, hazard category (see Table 1) and calculate the **Exposure Score** (see Table 2) for **every** chemical used. Expand the area in the table as required, either directly (if using a computer file version) or by appending additional sheets.

**Exposure Potential** (see Table 3) - complete this section for the chemical which has the **highest** exposure score in your chemical list as this defines the highest risk factor.

**Primary containment/Storage** - detail how and where, and for how long, the resultant product from the protocol will be stored. The product must be labelled with the date of synthesis, and disposed of (see below) before the maximum duration time has elapsed.

**Secondary containment** - detail where the protocol will be performed (refer to Table 4).

**Working Practice** - all SOTEAS local rules (including appropriate radioisotope and genetic manipulation rules) **must** be followed at all times. Identify here any additional practices.

**Other risk & control measures** - detail all additional risks, such as using autoclaves, high voltage equipment, use in the field etc., **and** what measures are taken to minimise the associated risks.

**Emergency procedures** - detail how spillages etc. would be handled, including clearance of the laboratory etc. as required.

**Disposal** - detail how you will dispose of surplus reagents and the product of the protocol. Final disposal must be undertaken within the period noted in the ‘maximum duration’ under ‘Storage’ (above).

**Supervision/training** - detail here what special supervision and training is required by the worker **named** at the bottom of the form. Note that all undergraduates are **always considered as research incompetent**.

**Declaration** - both the worker and the supervisor **must** sign this on the date entered here.

**Reassessment** - the first reassessment **must** be undertaken as soon as possible after the first time the protocol has been undertaken in order to identify any unforeseen hazards. After this first reassessment, the protocol should be reassessed every 6-12m, depending on the nature of the chemicals, to take account of changing knowledge concerning the hazardous nature of chemicals. The protocol must be reassessed immediately if new knowledge on the chemical hazards becomes available.

**NOTE** - standard protocols can be produced for each work environment **BUT** each worker **must** have their own personalised version, signed by them and their supervisor, and dated. These completed personalised protocols must then be appended to the UWS risk assessment form for the Teaching/Research activity belonging to the individual.

## Hazards, Risks and Containment - Definition of terms

**Hazard** potential for doing harm, e.g. toxic, flammable, carcinogenic *etc*

**Exposure potential** the risk to the user depends very much on the exposure, which depends on the physical properties of the material, the quantity used and for how long.

$$\text{Risk} = \text{"Hazard"} \times \text{"Exposure Potential"}$$

The risk is decreased to a safe level by:

- a) Containment
- b) Personal Protection
- c) Good Laboratory Practice (GLP)

## Levels of containment

The containment required for a given activity is of two basic kinds: the primary (or intrinsic) containment provided by the apparatus or equipment in which the substances are handled and the additional (or secondary) containment needed to ensure appropriate control of exposure.

## Hazard Category

**Table 1- General Guidelines for determining hazard categories**

<b>A</b>	<b>Extreme Hazard</b>	Substances of known or suspected exceptional toxicity (e.g. carcinogen, teratogen, potential mutagen)
<b>B</b>	<b>High Hazard</b>	All substances whose toxicity exceeds that of the medium hazard category, except for those known or believed to be so highly toxic as to merit special precautions (i.e. those in the "extreme" category)
<b>C</b>	<b>Medium Hazard</b>	Substances meeting criteria for CPL* classification as "Harmful" or 'Irritant'
<b>D</b>	<b>Low Hazard</b>	Substances not matching criteria for CPL* classification as "Harmful" or "Irritant"

CPL = the Classification, Packaging and Labelling Regulations.

### NOTE:

1. The toxicity considered should be that of the substance or mixture handled, including any impurities.
2. Substances may have other properties (e.g. flammability) which may call for additional precautions.
3. The above general guidance may need to be supplemented by developing additional criteria with the help of expert toxicological advice. (Additional criteria may be developed using, for example, data given in HSE Guidance Notes).
4. Time factors, such as frequency and duration of activity should also be considered. Short duration tasks, involving a few seconds exposure at infrequent intervals, should not affect the initial estimate, whereas continuous operations on a daily basis would probably raise the estimate to the

next highest category.

## Exposure Score

**Table 2 - exposure score to be calculated for all chemicals used in a protocol**

Exposure Score				
Calculation Value		1	2	3
(i)	Quantity	<1g	1-100g	>100g
(ii)	Properties	Dense solid Non- volatile liquid No skin absorption	Dusty solids Lyophilised solids Volatile liquids (b.p.>80°C)	Gases, Aerosols Highly volatile liquids (b.p.<80° C) Solutions promoting skin absorption
(iii)	Pressure	Normal	Low/Vacuum	>1 atmosphere
(iv)	Temperature	Room temperature	25°C - 100°C	>100°C

**Exposure Score calculation = (i) x (ii) x (iii) x (iv)**

## The Exposure Potential

**Table 3 - Rough calculation of exposure potential**

Exposure Score (From Table 2)			
Total score	<10	10-54	>54
Exposure Potential	L (low)	M (medium)	H (high)

## Secondary containment level calculation

**Table 4 - use to determine secondary containment**

Secondary Containment Level					
Hazard Category		A	B	C	D
Exposure potential (from table 3)	H	SA	SA	FH	FH
	M	SA	FH	FH	OB
	L	FH	FH	OB	OB

**OB = Open Bench; FH = Fume Hood; SA = Special Attention (see supervisor)**

## Appendix 2

### VDUs (Visual Display Units)

The Display Screen Equipment Regulations are for the protection of employees who use VDUs for an average of 2 hours or more every day. The following notes apply only to University employees but should be read by anyone who uses a VDU so that they are aware of how to avoid problems. Diagrams on the next page indicate points to look out for.

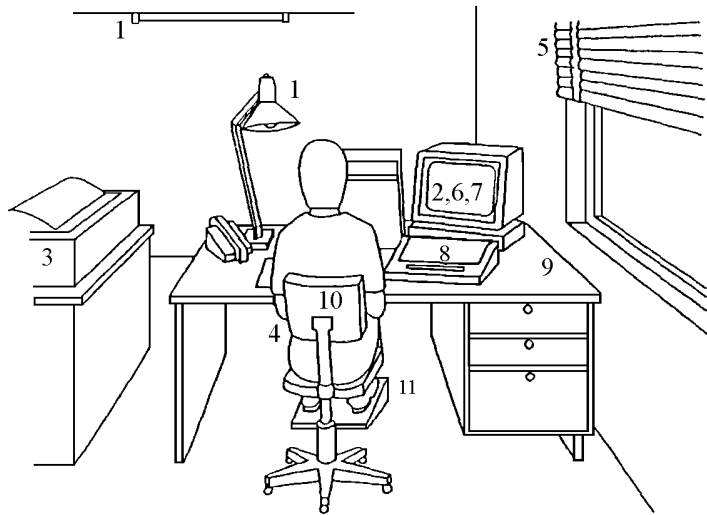
If you use a VDU for two or more hours every day then you should inform the School Safety Adviser. You should then visit the Occupational Health Centre for vision screening and attend one of the regular VDU safety training sessions arranged by the Staff Development Unit.

The University has the following obligations to users:

- 1) To assess, in conjunction with the School Safety Adviser, your workstation to ensure that it meets acceptable standards.
- 2) That work at a VDU is periodically interrupted by breaks and/or periods of other activity. It is recommended that no single session on a VDU should exceed 90 minutes, though shorter sessions are preferable. Where an uninterrupted session of 90 minutes is undertaken, a change of activity of 15 minutes should be allowed.
- 3) To provide "users" with as much information and training on all aspects of Health and Safety relating to their workstation, including the measures taken by the University to comply with its legal obligations. Training is advertised in the Staff Development newsletter.
- 4) To provide, on request, at no cost to the "user", an appropriate eyesight test carried out by an optician and thereafter at regular intervals.
- 5) To provide, if appropriate, prescription glasses for use with the VDU. The University is liable only for the cost of basic glasses, and if a "user" wishes to have a more expensive pair then they will be liable for the extra cost involved. These are to be provided if the prescription glasses are only to be used for VDU work.

The University agrees a contract with specified opticians for the eyesight tests. Contact the Occupational Health Centre for further details.

Before arranging the eyesight test a purchase order must be obtained from the School (via the stores) which must then be countersigned by the University Safety Advisor. The order can then be taken to the optician, quoting the appropriate reference number.

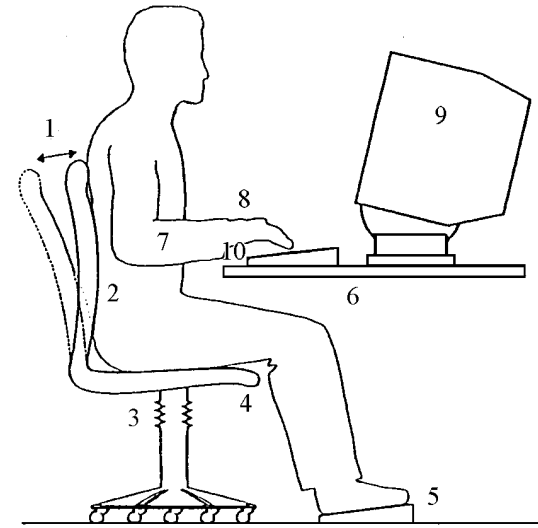


### Workstation Environment

- 1 Adequate lighting
- 2 Adequate contrast
- 3 Distracting noise minimised
- 4 Leg room and clearances allow postural changes
- 5 Window covering
- 6 Software: appropriate to task, adapted to user, provides feedback on system status, no undisclosed monitoring
- 7 Screen: stable image, adjustable, readable, glare/reflection free
- 8 Keyboard: usable, adjustable, detachable, legible
- 9 Work surface: allows flexible arrangements, spacious, glare free
- 10 Work chair: adjustable
- 11 Footrest

### Work Routine

- 1 All sessions less than 90 minutes
- 2 Activity changes:
  - 5 Minutes every 30 minutes
  - 10 Minutes every 60 minutes
  - 15 Minutes every 90 minutes



### Seating and Posture

- 1 Seat back adjustability
- 2 Good lumbar support
- 3 Seat height adjustability
- 4 No excess pressure on the underside of thighs and backs of knees
- 5 Foot support if needed
- 6 Space for postural change, no obstacles under desk
- 7 Forearms approximately horizontal
- 8 Minimal extension, flexion or deviation of wrists
- 9 Screen height and angle allow comfortable head position
- 10 Space in front of keyboard to support hands/wrists during pauses in keying

## **Appendix 3**

# **Health & Safety Committee Terms of Reference**

Reporting to the Head of School and /or the School Committee

To advise on the health and safety of all staff and students of the School and the safety of its premises.

This requires **inter alia**:

- 1 Liaison with the University Safety Advisor and Director of Occupational Health.
- 2 Inspection by Chairperson or representative and at least one other committee member of all School accommodation at least once in each academic year. The visits to be on an unannounced basis but not to disturb teaching activities. All matters requiring attention to be noted in a report.
- 3 Attention to the training factor in Health & Safety, embracing first aid courses, specialised safety courses and safety awareness by promoting the Safety Training Matrix.
- 4 Decide on safety rules and procedures within the School.
- 5 An annual report on Health & Safety in the School to be produced for submission to the School Committee and Head of School.
- 6 Production of a policy statement and regular updating of this.
- 7 Any member of the School is entitled to attend meetings of the Health and Safety Committee.

### **Radiation Hazards Sub-committee**

Reporting to the Health and Safety Committee.

- 1 In conformity with such regulation and guidelines as are laid down by law and by the University, to oversee the safe usage of radioactive isotopes within the School of the Environment and Society and to report annually to the Head of School upon the use of ionising radiation.
- 2 To receive reports of accidents involving radioactivity and to take appropriate action.

## **Special precautions in laboratories**

### **Appendix 4**

#### **Chemical and physico-chemical hazards**

Please see School website or Blackboard under Safety Information or click the following link:

[http://geography.swan.ac.uk/documents/safety/Appendix\\_4\\_chemico\\_physico.doc](http://geography.swan.ac.uk/documents/safety/Appendix_4_chemico_physico.doc)

### **Appendix 5**

#### **Use of hydrofluoric acid**

Please see School website or Blackboard under Safety Information or click the following link:

[http://geography.swan.ac.uk/documents/safety/Appendix\\_5\\_hydrofluoric\\_acid.doc](http://geography.swan.ac.uk/documents/safety/Appendix_5_hydrofluoric_acid.doc)

### **Appendix 6**

#### **Use of radioisotopes**

Please see School website or Blackboard under Safety Information or click the following link:

[http://geography.swan.ac.uk/documents/safety/Appendix\\_6\\_radioisotopes.doc](http://geography.swan.ac.uk/documents/safety/Appendix_6_radioisotopes.doc)

### **Appendix 7**

#### **Genetic manipulation and genetic modification**

Please see School website or Blackboard under Safety Information or click the following link:

[http://geography.swan.ac.uk/documents/safety/Appendix\\_7\\_Genetic\\_Manipulation.doc](http://geography.swan.ac.uk/documents/safety/Appendix_7_Genetic_Manipulation.doc)

### **Appendix 8**

#### **Precautions during fieldwork**

Please see School website or Blackboard under Safety Information or click the following link:

[http://geography.swan.ac.uk/documents/safety/Appendix\\_8\\_fieldwork.doc](http://geography.swan.ac.uk/documents/safety/Appendix_8_fieldwork.doc)

## Personnel involved in Health and Safety Matters

### School of the Environment and Society

Head of School	Prof. M.A. Doel	3090
Deputy Head of School	Prof. K.J. Flynn	5726
School Safety Adviser and Chair of Health & Safety Committee	Dr. J.E. Lancaster	5451
Genetically Modified Organisms	Dr. G. van Keulen	2669
Pathogenic Organisms	Mr I.F. Tew	4423
Fieldwork Safety	Dr. D.W. Forman	5445
Chief Technician (Biological Sciences)	Mrs. S.R. Walmsley	5453
Chief Technician (Geography)	Mr. A.F. Cutliffe	5241
Technician responsible for isotope work	Mrs. E.P. Diffley	4488

### University Safety Personnel

University Safety Officer	Mr. Graham Jones	5631
Assistant Safety Officer	Mr. Ron Knuszka	5150
Occupational Health	Enquiries	5538
Emergency		333

### Additional information

Skipper of Noctiluca	Mr. K. Naylor	4599
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Trained first-aiders within the School are listed on the notice board in the main entrance to the Wallace Building.

In the event of a minor injury that requires attention, please contact one of our first-aiders rather than staff in Occupational Health.