

UNIVERSITY OF SUSSEX

Science Schools

Safety Handbook

**EMERGENCIES
AT ALL TIMES CALL
INTERNAL 3333**

University of Sussex

Health and Safety Policy May 2009

Foreword

The health and safety of staff, students and visitors is of paramount importance to the University. The objective of our Health and Safety Policy is to enable the University to operate effectively and allow its staff, students and visitors to undertake their activities without detriment to their health, safety and wellbeing. Application of good practice in health and safety is recognised as being a key component in achieving high quality teaching and research. It is also acknowledged that failings in health and safety could not only have a harmful impact on the University's ability to conduct its business but also harm our reputation as well.

That is why we have set out in the University's Health & Safety Policy our commitment to good practice, responsibilities for health and safety, and the standards that we, the Executive and Council, are determined shall be met.

Good health and safety practice will only be achieved if staff, students and their visitors give their full support to the actions outlined within the policy.

Professor Michael Farthing
Vice-Chancellor and Chief Executive

Mr Simon Fanshawe
Chair of Council

Health and Safety Policy

Commitment

The University is committed to best practice in health and safety performance and to meeting its responsibilities for the health, safety and well-being of its staff and students, as well as others, including visitors, who may be affected by University activities. This can only be achieved through the application of good practice in health and safety and positive actions by its managers and staff. The University is committed to achieving effective control of risk by working to the health and safety management performance standards contained within this policy.

These relate to:

- *effective risk control measures and systems;*
- *competence of those involved in making decisions on health and safety ;*
- *continuous and planned improvement;*
- *taking corrective and preventative action based on monitoring, auditing and investigating activities;*
- *clear definition of arrangements;*
- *encouraging ownership through communication and consultation;*
- *leadership, resource allocation, and consideration of health and safety implications arising from business decisions.*

This policy applies to every aspect of the University's business, including all educational, research, commercial, residential accommodation, recreational and management activities. It applies to University owned companies.

Further to this the University recognises its relationship with Students' Union and will encourage the Union to adopt this policy where applicable.

Arrangements

Ultimate responsibility for health and safety within the University rests with the University's governing body, the University Council. The Vice-Chancellor is accountable to Council for health and safety performance.

The Vice-Chancellor has delegated authority for the success of the University's health and safety management system to the Registrar and Secretary.

The Director of Health and Safety is appointed by the Vice-Chancellor and is responsible for advising the University on matters of Health and Safety.

Heads of Schools, and Directors of Units are accountable for achieving compliance with the University health and safety policy and standards within their own areas of accountability. They should appoint a competent person to assist in co-ordinating health and safety and to help them oversee the following:

- reviewing health and safety performance and objectives;
- establishing arrangements to achieve compliance with University health and safety policy and standards within their own areas of accountability.
- publishing a written statement describing the arrangements within their areas of accountability
- publishing an annual report that summarise performance and define plans for improvement.

Staff in a supervisory position, including **faculty members** responsible for students, are accountable for the health and safety of the personnel, activities, and projects that they supervise. They must comply with the University's health and safety policy and any other relevant arrangements within their area or activity.

Every individual member of staff, student, visitor or contractor has a responsibility to take care of their own health and safety, take due consideration for the health and safety of others, and not interfere with or misuse facilities that are there in the interests of health and safety. Each individual must comply with the University's policies and standards, and the relevant arrangements for the area or activity.

Consultation with staff and student representatives on the views of staff and students regarding health and safety issues will be conducted via the Health and Safety Committee.

Other persons who could also be affected by the University's activities will, where necessary, be consulted with and provided with appropriate information.

Risk Control

Appropriate precautionary measures must be taken to minimise significant risks to the health and safety of all persons so that they are not exposed to sources of imminent danger. The range of measures that are used to mitigate specific risks shall be formalised as risk control systems. Risk control systems and associated precautionary measures must meet requirements set out in legislation and associated approved codes of practice. They should take account of best practice and follow the recognised hierarchy for risk control.

Risk assessment techniques shall be used to confirm that arrangements for risk control are appropriate. Where uncertainty exists about the degree of hazard, measures for risk control shall be adopted that should protect people from harm despite the uncertainty.

Competence

Competent advice on health and safety matters must be available and taken into consideration when making decisions. Persons must be competent to carry out activities safely without harm to themselves or others, they must be provided with appropriate information, instruction, and training and must be effectively supervised by persons who are competent to do so.

Planning, Objective Setting, and Review

There shall be processes for objective setting, planning, and resource allocation to ensure that action is taken to achieve satisfactory health and safety performance in general and control of risk in particular. These shall be based on the findings of reviews of the effectiveness of the management of health and safety and of the control of risk.

Corrective / Preventative Action, Monitoring, and Audit

There shall be a planned programme of monitoring the ongoing effectiveness of measures that are critical for the control of risk. Staff and students will be encouraged to report unplanned events that indicate shortcomings in risk control. Investigations shall be carried out and action shall be taken to correct unsafe situations and to prevent further unplanned events. Compliance with policy and standards shall be audited and reported against.

Arrangements

There shall be effective management structures and arrangements for delivering policy and for allowing staff and students to make a responsible and informed contribution to the health and safety effort. Those with defined accountabilities for health and safety shall have appropriate authority so as to ensure that they can fulfil their accountabilities. Health and safety issues shall be addressed at the specification, design, development and implementation phases in all planning, projects and working practices within the University and in its dealings with suppliers and contractors.

Ownership

Ownership of health and safety shall be encouraged among staff and students through pooling of knowledge and experience, and the establishment of formal structures involving senior managers for consultation with staff and student representatives. Staff shall be consulted and informed about health and safety issues that affect them. Health and safety information shall be kept up to date and shall be communicated as appropriate.

Leadership

Managers shall support this policy, influence the planning of improvements, and allocate resources according to risk priorities. The health and safety implications of business decisions shall be considered and addressed at the specification and design stages as well as at the development and implementation phases.

I INTRODUCTION

This booklet is intended to help you avoid accidents. Accident prevention must be the aim at all times. The effects of accidents may be disastrous not only to you but also to your colleagues. It is therefore important that you read the advice given here at the start of your work in the university. Accident prevention is mainly common sense, tidiness and forethought, but safety in the laboratory does require constant vigilance and care. Always seek expert advice when in doubt about the safety of a practice.

Safety in Universities is regulated by UK criminal law, which is set down in the HASAWA 1974 and in a series of associated regulations, notably the Management of Health and Safety at Work Regulations, under which prosecutions may be brought against individuals rather than against the University. Inspectors from the Health and Safety Executive enforce safety regulation. They have the right of access into university buildings at any time and have the power either to serve enforcement notices or prosecute an individual member of the University or the University itself. Enforcement notices may be either,

- i) Prohibition a notice may be served to close a laboratory or workshop or to stop an individual carrying out a particular action, or.
- ii) An improvement notice, which will require some change in practice or procedure or the provision of additional safety equipment. A time will be set for this to be complied with

The effective management of safety therefore involves not only taking care to prevent injury, suffering or loss which result from accidents, but also achieving compliance with safety legislation and ultimately avoiding the severe penalties which may be imposed by the HSE or the courts. The school safety handbook is therefore an important component of the safety management safety being designed to give guidance and information to everyone within the school with whatever work activities they are involved.

Further Safety Information Documents

These are available on the University web pages as Safety Procedures & Guidance notes and as University policy documents. They contain more detail on subjects covered in this document and on other special risks and activities not covered herein. You should consult these for the rules for any activity you are engaged in and for guidance on Health and Safety issues. See appendix 1 for full list of University of Sussex Safety procedures and Guidance documents and Safety Policies.

Always seek expert advice if you are unsure about the safety of a practice

II GENERAL INFORMATION

1 WORKING HOURS and ACCESS TO BUILDINGS

The buildings are officially open from 8.30 hrs to 18.30 hrs Monday to Friday inclusive. At all other times access is restricted and various conditions for entry and working during closure hours must be adhered to in agreement with the Safety Procedures and Guidance for working in University Buildings outside normal working hours (SPG-11).

Undergraduates are not allowed in the Science buildings outside of working hours unless attending late lectures or they are in supervised laboratories for project work and have written permission from a member of faculty.

Visitors shall report to the premises reception desk or be met at the entrance to the premises by the person they are visiting and should not be allowed general access to the buildings unaccompanied. **Children** under 16 years of age are not permitted in the buildings unless under the direct supervision of a member of staff and then only in designated areas. In no circumstances should they be allowed in laboratory areas without prior authorisation from the relevant Head of Department and School Safety Adviser.

Out of Hours Running of Unattended Experiments

Experimental apparatus or equipment should not be left running unattended out of hours unless absolutely necessary, in which case a risk assessment shall be carried out and a permit providing emergency contact details, etc. completed and prominently displayed in an appropriate location. Both must be authorised by the Supervisor responsible for the work. See the *School Rules for Out of Hours Running of Unattended Experimental Apparatus*.

2 REPORTING OF ACCIDENTS AND INCIDENTS

All accidents where someone is hurt, regardless of extent of injury, or any incident where someone could have been injured, must be reported to the School Safety Coordinator or your supervisor. Completion of an online accident/incident report form is a statutory requirement.

Accidents involving ionising radiation must be reported immediately to the University Radiation Protection Adviser

III EMERGENCY PROCEDURES

In an emergency there will be no time to find out what you have to do.
Therefore you should familiarise yourself with the emergency procedures.

You must know:-

- The layout of your Buildings.
- The location of fire escapes (especially for outside normal hours)
- The position of fire extinguishers and how to operate them
- The sound of your nearest fire alarm and how and where it is set off
- The position of nearest telephone which gives access to the Emergency Services
- Where and how to obtain First Aid help
- Any special local precautions
- Where to obtain accident report forms, which should be filled in and sent to School Safety Advisor for all accidents and significant "near misses"

1 GAS- SIGNIFICANT LEAKS

- a) Dial 3333 on the internal telephone.
- b) Extinguish naked flames, switch off sparking motors, post warning notices and keep people out of the area. Do not operate any other switches.

2 ACTION ON HEARING THE FIRE BELL or ALARM SOUNDER

- a) Leave your room or area.
- b) Go to your assembly area which will be away from the building entrance. Do not use the lift when evacuating the building.

3 ACTIONS ON DISCOVERING A FIRE

- a) Operate fire alarm.
- b) Check for persons at risk - (if no personal risk is involved).
- c) Only attempt to fight a fire if it is small, you have a clear escape route at all times **and** you have been trained to do so
- d) Go to the building control point (usually at the entrance to the building) to advise the University Rescue Team, Fire Service or Fire Marshal of the location of the Fire. Do not use the lift when evacuating the building. See the Safety Office web pages for control point locations.

4 FIRE EXTINGUISHERS

Those extinguishers which have been used for fire fighting must be replaced immediately, inform the School Safety coordinator or the Estates complex supervisor via the Porters.
Remember that different classes of fire require the use of different extinguishing media.

CO₂ - General use on small fires, particularly for electrical and small flammable liquid fires

Foam - Multi purpose, particularly for solvents, flammable liquids

Dry Powder - Fires involving metals e.g. Na, K, organo metallics, etc. and electrical fires.

Other types of extinguishing media are obtainable for specific purposes. Seek advice if you have a particular fire risk, e.g. some laboratories have special dry powder extinguishers for lithium fires.

Fire Blankets

These should only be used to put out very isolated small fires and for smothering burning clothes.

5 FIRE WARDENS

Fire wardens have been allocated the responsibility of evacuating specific areas and will ensure their area is cleared before reporting to the control point. Your co-operation is essential, those failing to do so will be reported to the relevant line manager.

After the alarm has been sounded, the University Rescue Team will take all necessary action in the event of a fire until the arrival of the Fire Brigade. On arrival, the Fire Brigade's senior officer present on the appliance will assume responsibility for dealing with the fire, but members of Faculty, Senior Technical Staff, and the person or persons responsible for the area in which the fire started must stay available to give advice to the Fire Brigade.

6 **Fire Drills**

Fire drills are held in all University buildings during the academic year. Any faults discovered during these drills, such as exit doors or fire alarms not operating correctly or problems with escape routes, should be reported immediately to the School Safety Adviser.

6 CONTROL AND ASSEMBLY POINTS

The control and assembly points are listed on the safety office web pages and posted on school safety notice boards. At these positions a Fire Marshal will await information from persons who have knowledge of the fire or incident, and floor wardens who will advise whether or not their areas of the building have been evacuated. The Rescue Team will report to the Control Point as will the Fire Service. First Aiders are asked to report to the control point in case there are casualties needing assistance. Remember that the sounding of fire alarms may have occurred because of an explosion or other serious incident - not necessarily a fire.

7 FIRST AID PROCEDURES

For most incidents the normal procedure to be followed is:-

- a) For minor injuries – – Staff and students should ensure they are aware of the nearest location of first aid supplies. Even minor scratches should be washed thoroughly in cold running water before applying a plaster.
- b) If the injury appears to be of a more serious nature, dial internal 3333 to summon mobile first aid assistance.
- c) If it is obvious that an ambulance will be required, follow procedure b) and then request an ambulance, stating number of casualties and precise location.

For injuries involving chemicals, biological or radioactive materials

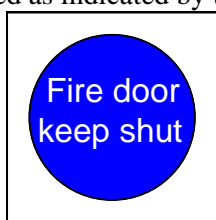
Seek the assistance of occupational first aiders who are on radio call by calling 3333.

IV GENERAL LABORATORY PRECAUTIONS

There are many risks involved with laboratory work. These are detailed on the following pages along with the precautions to be taken.

1 LABORATORY HOUSEKEEPING

- a) Keep the laboratory and benches tidy. Store apparatus no longer required and ensure that waste material is removed as soon as possible.
- b) Keep all corridors and passages clear. In particular, access to fire escapes and to fire extinguishers must on no account be impeded.
- c) Keep fire doors closed as indicated by the signs.



- d) Always be careful when opening laboratory doors. Except in dire emergency no one should ever run in a laboratory building.
- e) No one should smoke, eat or drink in laboratories.
- f) Laboratory coats should be worn at all times when working in a laboratory, remove laboratory coats/gloves and wash hands when leaving the laboratory environment to prevent contamination of common areas of the buildings.
- g) Make sure all containers are clearly labelled. Never take chances with an un-labelled container. Before handling chemicals/substances refer to the COSHH hazard assessments for the lab/workshop which must be produced by the lab/workshop supervisor.
- h) All gas cylinders should be either in a stand or chained to ensure that they are safe. Fuel gases and oxidising gases must always be stored separately even empty cylinders. Cylinders surplus to requirement and empty cylinders must not be stored in the laboratory, but moved to the separate store area.
- i) Quantities of highly flammable liquids should be kept to a minimum and must be stored in a spill tray within a labelled approved wooden cupboard or metal container.
- j) Radios are not allowed in laboratories as they may prevent the users from hearing alarms or calls for assistance.
- k) Experimental work may only be carried out by undergraduates in the undergraduate laboratories when a demonstrator is on duty. Laboratory coats and safety glasses must be worn in chemical laboratories.

2 EYE PROTECTION

SAFETY GLASSES MUST BE WORN AT ALL TIMES IN ALL CHEMISTRY & BIOLOGICAL LABORATORIES AND ANY OTHER AREA WHERE THE BLUE MANDATORY NOTICE IS SHOWN ON THE DOOR.



Permanent Eye Protection Areas (PEPA's)

The areas within which eye protection must be worn at all times,

In areas which are not designated as PEPAs, eye protection should be worn as and when required by good laboratory practice as outlined by the risk assessment for the activity being undertaken.

Within a PEPA the type of eye protection worn must also be consistent with good practice as outlined by the activity risk assessment. Full eye protection, face shields and goggles, must be used when the process engaged in involves significant risk of splashing of corrosive materials, flying fragments etc. The minimum level of protection permissible for any type of experimental work within a PEPA is wearing of safety spectacles conforming to BS2092.2. Ordinary sight-correcting spectacles afford basic protection against minor splashes etc. and represent the minimum level of protection for personnel passing through a low risk section of a PEPA, but not working there.

If prescription glasses are necessary these should be made in safety glass, or further protection worn as well, such as Pulsafe Armamax over spectacles. Safety prescription glasses should be inspected annually by a qualified optician.

These safety rules will be strictly enforced. The monthly safety inspections will pay particular attention to the wearing of eye protection by workers in PEPAs. Failure to comply will lead to exclusion from the laboratories.

3 APPARATUS AND SERVICES

a) Do not use apparatus without first reading instructions and then only if you understand its operation. Before using any apparatus or equipment refer to the safe working practices document for that lab/workshop and any project risk assessment for research equipment which must be produced by the lab/workshop supervisor.

a) Do not interfere with safety guards or electrical interlocks on apparatus.

b) Do not overload electrical supplies and ensure that appropriate fuses are fitted.

c) Use appropriate protective clothing (safety glasses, gloves, lab coats, etc.) where this is recommended.

d) Do not obstruct service controls, such as distribution boards, mains isolators, fire hoses and fuse gear.

e) Where possible avoid the use of trailing cables and in particular do not use portable fires or heaters in the laboratory. Radiant fires are prohibited in all University buildings.

f) It is forbidden to work alone with hazardous materials or machinery and every effort must be made to ensure that someone is within calling distance should an emergency arise.

See Safety Procedures and Guidance for working in University Buildings outside normal working hours SPG-11.

4 GLASSWARE

Many accidents occur in the handling of laboratory glassware therefore all work must follow the University of Sussex Safety Procedures and Guidance SPG-04 Safe Working with Laboratory Glassware.

5 FIELDWORK

All fieldwork is subject to the University of Sussex Safety Procedures & Guidance for Safety in fieldwork SPG-26 formally SSC/79/1.

Consult your supervisor before undertaking any field work operations, and ensure that you have considered the possible hazards, have obtained advice and have worked out a safe system of work to minimise the risk.

6 FOOTWEAR

Footwear providing adequate protection **MUST** be worn in the Laboratories and workshops at all times. (i.e. sandals or bare feet are not acceptable).

7 MEDICAL CONSIDERATIONS

- a) Medical Disorders. It is advisable that people with known disorders, which may need special attention, should inform their supervisor and make sure that companions or colleagues know what to do.
- b) Contact Lenses. It is advised that contact lenses are not used when working with chemicals.
- c) Pregnancy. Refer to Safety Information on the Safety Office web pages for New and Expectant Mothers at Work, Guidance on Compliance with the Management of Health and Safety at Work (Amendment) Regulations.
Women of reproductive capacity who suspect that they may be working with teratogens or teratogenic materials should consult the University of Sussex Safety procedures and guidance for the Control and Use of Carcinogenic, Mutagenic and Teratogenic Substances (SPG-10) and if necessary seek further advice from either their Faculty Supervisor or the School Safety Coordinator. Pregnant women should consult the School Radiation Protection Advisor before working in radiation laboratories.

8 AEROSOLS/SPRAY CANISTERS

These can be highly dangerous if wrongly handled. Never keep aerosols or spray canisters in direct sunlight or near any source of heat. Always use in well-ventilated areas. Many aerosols have a highly flammable propellant - never use them near a source of ignition.

9 REFRIGERATORS

All refrigerators should be labelled as to its use; chemicals and food should not be mixed. No highly flammable or flammable solvents should be stored in refrigerators unless they are certified sparkproof. Refrigerators used for the storage of radioactive materials should be clearly labelled with the correct hazard sign and **MUST** be secured when not in use. Refrigerators used for storage of human materials **MUST** be secured when not in use.

V PRECAUTIONS with CHEMICALS

COSHH (Control of Substances Hazardous to Health): All chemical and biological work undertaken in research and teaching must be subjected to a hazard and risk assessment (COSHH assessment). This is a legal requirement within the framework of the Control of Substances Hazardous to Health Regulations 1988 (revised 1994). See Safety Procedures and Guidance for the implementation of the Control of Substances Hazardous to Health Regulations 1994 (SPG-23).

1 Toxicity of Chemicals

- (i) Very few chemicals are completely harmless. They may cause damage if inhaled, ingested, enter through cuts or are absorbed through the intact skin.
- (ii) To minimise inhalation fume cupboards should always be used for procedures in which toxic or harmful vapours, dusts or gases may be emitted.
- (iii) Protection against contamination and ingestion depends mainly on good housekeeping. A safe system of work must be used to minimise risk.

2 Handling of Chemicals

- (i) Try to use small quantities where danger may exist, especially if there is a risk of explosion.
- (ii) **Pipetting by mouth is forbidden.** Alternative methods for filling pipettes and burettes must always be used. This applies to all liquids.
- (iii) Safety glasses/face shield and appropriate skin protection (e.g. gloves and coat) must be worn when handling any chemicals. If ANY chemical (especially an acid or alkali) enters the eye this should be washed at once with a copious supply of sterile saline or tap water.
- (iv) Care must always be taken in opening all bottles and drums. This is especially the case with unlabelled items. All unidentified chemicals must be treated as dangerous and suitable protective equipment must be used in handling such material.
- (v) Always wash your hands after handling chemicals.
- (vi) Refer to the laboratories hazard and risk assessment, this will include an assessment of the chemical toxicity to comply with the COSHH regulations and safe working practices before starting any work. This hazard and risk assessment should be produced by the Laboratory Supervisor or by individual researchers or technicians and approved by their supervisor. Ask to see it.

3 For Scheduled Chemicals

The University is obliged to record purchase of chemical that are precursors in the manufacture of drugs or chemical weapons. Indeed suppliers should not supply these goods unless a declaration from the University is submitted with the order

Members of faculty are responsible for the provision of safety advice and are responsible for the supervision of all work involving poisons in research and teaching situations for which they are responsible.

Ordering Procedure

Are to be found in

http://www.sussex.ac.uk/lifesci/documents/p10_procedure_for_category_1_and_2_substances.doc

4 Spillage of Chemicals

See SPG-32 Emergency Spills procedure

- (i) Whenever possible, provision should always be made for certain chemicals in the event of breakage or spillage, e.g. by working and storing on a tray.
- (ii) Solutions spilt on the bench or floor should be cleared up immediately, strong acids being neutralised with sodium carbonate and caustic alkalis treated by dilution with water. Contain any spillage and wash area well with water.

5 Disposal of Chemicals

See SPG-14 formally SSC-69-5 Disposal of waste chemicals.

- (i) Before any chemical is ordered or obtained an assessment must be made of the method of disposal.
- (ii) For all disposals refer to Safety Procedure and Guidance for the Disposal of Waste Chemicals SPG-14.
- (iii) Under no circumstances may un-labelled material be put out for disposal without first checking with the laboratory supervisor for the correct procedure.
- (iv) It is essential that before research workers and student leave on completion of contracts or course they must dispose of all un-wanted chemicals in a safe manner. It is not permitted to leave un-labelled materials anywhere at any time.
NOT PERMITTED TO LEAVE UN-LABELLED MATERIALS ANYWHERE AT ANY TIME.
- (v) Liquids, which are not miscible with water, must not be placed in the drains. Water-miscible solvents disposed of in the sinks must always be flushed with a substantial quantity of water.
- (vi) ALL chlorinated solvents for disposal will have to carry a tie-on label on which is written:- LAB. No.' and 'CHLORINATED SOLVENT FOR DISPOSAL'. Waste acetone and chloroform must not be mixed, as the mixture may cause strong exothermic reaction. (Ref. Chem. and Ind. 1970, 185)

6 Poisons

Refer to University of Sussex Safety Procedure 7 Guidance SPG-09 (formally SSC-59-5) for control and use of poisons. Note: List 'A' poisons must be very carefully controlled and permission for their use must be obtained from a supervisor and a full risk assessment undertaken.

If there is any doubt regarding toxicity of a compound then refer to University Health, Safety & Environment Office for advice.

For All Scheduled Poisons

The basic aim is to be aware of the potential danger in the toxicity of these compounds, to ensure that they cannot easily fall into the hands of unauthorised persons and to ensure that they do not harm fellow workers or visitors to the laboratory.

Members of faculty are responsible for the provision of safety advice and are responsible for the supervision of all work involving poisons in research and teaching situations for which they are responsible.

Ordering Procedure

Orders for 'List A' Poisons must be signed either by a member of Faculty, Grade & technician or higher. The word poison must be clearly marked on the order. Refer to the NIOSH Register or other source to check chemicals you are using or propose to use.

VI WORK WITH BIOLOGICAL AGENTS

Biological agents include microorganisms, cell cultures and human endoparasites. The Control of Substances Hazardous to Health (COSHH) Regulations include a large section on the control of biological agents. To enable persons working with biological agents to comply with the requirements of schedule 9 the following University Safety Procedures and Guidance are available:-

SPG-24 formally SSC/78/2 Control of Biological Agents, (COSSH).

SPG-20 formally SSC/74/2A Guidance for the Safe Working with Microbiological Material.

Everyone in the school who intends to work with biological agents, including blood samples, tissue samples and plant material must first discuss their proposed work with the University Health & Safety Office before bringing biological material into the school.

Advice on hazards and risks can be obtained from the University Health & Safety Office.

The Genetically Modified Organisms (Contained Use) Regulations 2000 require that anyone carrying out an activity involving genetic modification does so in conditions of contained use which satisfy the regulations. This includes carrying out a risk assessment for both human health and environmental protection and in some cases submitting a notification and requiring consent from the enforcing authority.

Work involving genetic modification must not commence until it has been approved by the Genetic Modification Safety Committee. Those wishing to carry out work involving genetic modification should complete the appropriate proposal and risk assessment form, available via the University safety website:

- Genetically modified animals
- Genetically modified plant viruses
- Genetically modified human and animal viruses and viral vectors
- Genetically modified micro-organisms other than viruses
- Genetically modified plants

VII WORK WITH HUMAN TISSUE

It is a compulsory requirement that anyone wishing to work with and store human tissue first contact the appropriate manager of human tissue (Persons Designated) in your department. The receipt, storage, use and disposal of human tissue must follow standard operating procedures (SOPS).

VII ELECTRICITY

All work with electricity is subject to the University of Sussex Safety Procedures and Guidance Document, SPG -13 'Notes of Guidance for the Implementation of the Electricity at Work Regulations formally SSC/61/6.

1 ELECTRICAL HAZARDS

The risks associated with electrical supplies and equipment, including batteries and condensers, can cause injury and even death as well as starting fires and explosions.

(a) Electrical Burns

Immerse in cold water for 10 minutes then send casualty to the Health Centre.

(b) Shock

Electric shock is the effect produced on the body, particularly its nervous system, by an electric current passing through it, and its effect depends on current strength (which in turn depends on voltage). If someone receives a shock switch off the electrical supply before removing the casualty. If this is not possible, push casualty away from conductor with a piece of wood or insulator to avoid being a second victim yourself.

(c) High frequency burns

Radio frequencies can produce deep-seated burns that are slow healing and painful, although the outward blistering may be slight. All R F Burns, therefore, however trivial in appearance, must receive medical attention.

2 PRECAUTIONS IN THE USE OF ELECTRICITY

BEFORE BEGINNING WORK, FIND OUT WHERE THE ISOLATING SWITCH IS LOCATED.

(a) Permanent Wiring

All power cabling, switchgear and permanently installed equipment must comply with statutory regulations and work on them must be carried out in a prescribed manner by authorised personnel. Only Estates approved electricians can make permanent wired connections to service power.

(b) Mains Operated Equipment

All new equipment should be checked before use, by an authorised technician

Use suitable cables and leads, properly protected against water, solvents and chemicals, and strap and secure them neatly. Cotton covered twin cord is unsuitable for laboratory use and as PVC insulation softens at quite low temperature, it should not be used near heaters. All external wiring should be double insulated.

Emergency switches and isolators may be required for complex apparatus. They should be accessible and clearly marked. Residual Current Circuit Breakers (RCCB's) should be incorporated on systems that have a potential danger of shock. Portable RCCB's should be used when doing maintenance work away from a protected bench.

(c) Portable Equipment

Special care is required with portable equipment. Regular inspections are made for earth continuity, insulation resistance and mechanical condition. But it is the responsibility of the user to check the test label and that the leads have not been damaged before use.

(d) Batteries

Lead-acid accumulators give off flammable hydrogen and oxygen under charge. Adequate ventilation is therefore essential in battery charging rooms. Disposal of old batteries is via the stores.

VIII RADIOACTIVITY & RADIATION HAZARDS

There are particular risks when working with radiation of all types.

1 RADIOACTIVE MATERIALS & SOURCES OF IONISING RADIATION

The basic principles together with details of the operational aspects of Radiation Protection at the University of Sussex are set out in the University Safety Procedures and Guidance SPG-05 for Working with Radioactive Materials and Ionising Radiation, formally SSC-48-1.

Any undergraduate experiment must have a safe system of work as part of the script, ask the demonstrators. Postgraduates and research workers will need to obtain a university licence before working in laboratories involved in radioactive work.

2 LASERS

In virtually all cases, exposure to the direct beam or even to the reflected radiation must be regarded as hazardous. When such light enters the eye, it is concentrated on the retina and may produce a permanent blind spot. In some circumstances, damage to the lens or skin burns may result. Although the blink reaction gives protection from visible class 1,2 and 3A lasers, (class 3B and above require special precautions). Any undergraduate experiment must have a safe system of work as part of the script, ask the demonstrators. Refer to Safety procedures and guidance SPG-08 formally SSC-56-2.

Postgraduates and research workers working with lasers of Class 3B or above must see the Laser Safety Video before starting work. The Safety Office must be notified of any new laser of class 3 or above before it is put into use.

3 ULTRA-VIOLET RADIATION

Ultra-violet radiation lies in the band of wavelengths from 400-100nm. Ultra-violet quartz-halogen lamps are the most usual sources in the laboratories.

Short exposures from ultra-violet radiation can damage the eye or the skin and injury can result even if one does not look directly at the light. The energy is adsorbed in the outer layers of the eye and conjunctivitis results several hours after exposure, persisting for several days.

IX MACHINERY

All aspects of machinery must be controlled and used according to the SPG-02 *University Code of Practice for Workshop Equipment and Tools (Formally SSC-22-7)*. In addition, managers and supervisors must ensure that all machinery and plant is, where appropriate, regularly inspected and efficiently maintained.

1 SAFETY PRECAUTIONS IN WORKSHOPS

Whenever you enter a Workshop, if it is not your place of work, you must report to the area supervisor first before working on any equipment.

- (a) Long hair, and loose clothing are potential hazards when using machine tools. Keep long hair tied back and clothing done up.
- (b) Ensure that the correct guards are fitted to all moving machinery and that all safety devices are working.
- (c) Make sure that you know how to switch the machine off in an emergency. Emergency controls should be conspicuously labelled.
- (d) Machine tools should never be left running unattended.
- (e) Stop machine tools dead before changing gears, or lubricating. Remove drills, lathe tools and cutter, etc. before cleaning down. Lower circular saw blades when not in use.
- (f) Never try to handle moving swarf. Even stationary swarf can be sharp and the use of leather gloves is advised.
- (g) **DO NOT LEAVE CHUCK KEYS IN LATHE OR DRILL CHUCKS.**
- (h) Use a vice or clamps to secure the work piece when drilling.
- (i) Safety shoes are a valuable protection for those handling heavy objects, especially in workshops and stores. Open-toed shoes must not be worn in Workshops.
- (j) Wear safety glasses or goggles for any machinery process that may cause swarf or particles to be emitted. Use dust and fume extraction equipment where provided and its use is advised. If you wear spectacles - either wear goggles or full shield as well, or get prescription lens safety spectacles.

2 GRINDING WHEELS

Grinding wheels are a particular hazard. Goggles must be worn at all times when working on grinding wheels. Changing and dressing wheels should be done by someone trained and officially approved. Consult Workshop Supervisor. Do not clog grinding wheels with soft material and never grind with the side of the wheel either may later cause them to shatter.

3 WELDING BRAZING AND CASTING

These practices can cause a risk of injury to the individual and others and must be carried out only in an area appropriate to the purpose.

To avoid eye damage, proper goggles or face shields must be worn by the welder and anyone else in the welding area. Sightscreens must be placed around the welder and in permanent welding booths; the walls must be painted with non-reflective paint. Welders must wear protective gloves.

Adequate local exhaust ventilation must be provided where welding or brazing is done. Toxic gases are liberated when lead, cadmium and many other materials are heated to welding, brazing or casting temperatures. Refer to sections of SPG-01 LEV and SPG-02 code of practice for workshops.

X PRESSURE & VACUUM SYSTEMS

1 HIGH PRESSURE SYSTEMS

Refer to the High Pressure Safety Code of Practice published by the High Pressure Technology Association, and the University Safety Procedures and Guidance SPG-35. New designs must be approved by the University Insurance Engineers before prototypes are made and tested. Regular inspection of pressure systems is vital to detect corrosion, fatigue and cracking, filter blockage or relief valve failure. In research areas the user should inspect his apparatus regularly

2 COMPRESSED GASES

See SPG-34 Gas Cylinders and pressure vessels.

- (a) Gas cylinders should be treated with care at all times. In use or in storage, cylinders should not be left free standing but anchored to a wall or bench. They should be transported on trolleys and never dropped or bumped down stairs.
- (b) Cylinder valves should be opened slowly by hand pressure using the standard key. No attempt should be made to force stiff valves with hammers or wrenches. Cylinders with stiff valves should be made safe and returned to the supplier.
- (c) Different gases for different purposes are supplied at widely different pressures and regulator valves must be suitable for the gas and cylinder pressure in use. Ensure the cylinder valve is closed before removing the regulator.
- (d) Empty and unused cylinders should not remain in laboratories and should be returned to gas store.
- (e) Special care is needed in the handling of flammable and poisonous gases. Many gases are readily ignited and form explosive mixtures with air over a wide range of concentrations.

4 LIQUEFIED GASES

Cold liquefied gases and solid carbon dioxide present a number of hazards. Severe burns can result from mishandling, especially if the liquid is trapped in shoes or clothing. Gloves should not be worn when handling liquid nitrogen as the trapped liquid can cause burns.

The rules for filling dewars with liquefied nitrogen are on a notice at the Liquefier Filling facility. You must follow the procedures indicated.

The evaporation of large quantities of liquid nitrogen or the sublimation of large quantities of carbon dioxide in confined areas may result in displacement of oxygen and the risk of asphyxiation. Liquefied gas containers must be handled carefully at all time.

They must be protected from the weather, i.e. not left out of doors or in conditions favourable to the formation of an ice plug in the neck. Ice plugs can cause a 300 psig pressure build-up and an explosion. Such obstruction of the neck should be cleared with clean metal rods by an operator standing as far away as is practicable.

5 COMPRESSED AIR

Jets of compressed air are highly dangerous and should NEVER be pointed at other people (or oneself). Compressed air can cause skin damage.

Compressed air hose must be kept in good condition and anchored so that it cannot thrash around in the event of a breakage.

Compressed air should not be used to clean down machine tools or to remove grit or swarf. A vacuum cleaner or a brush are safer and avoid spreading foreign matter over surrounding equipment.

6 VACUUM SYSTEMS

- (i) Examine all glass apparatus for strain as it is assembled and after the apparatus is fitted.
- (ii) Avoid stresses between different components by using a plastic tube, where appropriate, or bellows.
- (iii) Wherever possible, glass apparatus should be screened
- (iv) Rubber bungs must be large enough to avoid being sucked into the vacuum vessel. Stopcocks must be properly lubricated and turned slowly. Do not attempt to force a frozen stopcock.
- (v) Rotary pump outlets should be vented to the outside.
- (vi) The outside surfaces of glass dewars should always be taped, preferably with woven type material (rather than plastic) to avoid the dangers of flying glass.

7. AUTOCLAVES

The major hazards associated with autoclaves are:

- explosive breakage of vessels during opening and unloading;
- scalds from steam;
- burns from physical contact with the autoclave or careless handling of vessels containing boiling liquids;
- failure of component parts of the autoclave whilst under pressure

Local safe systems of work for each autoclave will be sited near the autoclave and must be adhered to at all times. Autoclaves must only be operated by people who have been authorised to do so and who are trained in their use. Items containing radioactive materials, corrosives, solvents or volatiles should not be autoclaved.

Heat resistant gloves should be worn when opening the autoclave after a cycle. If there is a sharps hazard (e.g. biological waste), heat AND cut resistant gloves should be worn.

All autoclaves should be registered with Estates and will be periodically examined, at least annually, by a competent person in compliance with the *Pressure Systems Safety Regulations*.

XI OFFICE SAFETY

(a) Office equipment and furniture can be heavy. Care should be taken when anyone is moving it to avoid undue strain, get help for very heavy objects, see Manual Handling.

(b) Four-drawer filing cabinets can over balance if both upper drawers are opened at the same time, do not do this.

(c) On electrical equipment do not remove any screwed down covers. On equipment where access is provided to clear jams etc., turn the power off if this does not happen automatically. Turn the power off before cleaning.

(d) Ensure all electrical cables are placed so as to avoid creating a tripping hazard.

(e) Keep all combustible materials away from electrical heaters. Note that exposed element radiant heaters are banned from all University buildings.

(f) Before leaving work switch off all electrical appliances, where it is safe to do so.

(g) Do not stand on revolving chairs and stools.

XII D.S.E. (DISPLAY SCREEN EQUIPMENT)/VDU'S (VISUAL DISPLAY UNIT'S)

Refer to the University Display Screen Equipment Policy and guidance on the Safety Office web pages.

XIII MANUAL HANDLING

A significant part of the work undertaken by technicians, porters and cleaners involves manual handling. There are risks of injury by the use of incorrect lifting methods or attempting to lift or move heavy or awkward loads. Refer to the University Safety Procedures and Guidance SPG-15.

Do not rush or take risks when moving loads, always assess the task before starting. Having assessed the task, get help if required and use the correct lifting equipment designed and provided for the purpose. If in doubt ask for help.

XIV SPECIAL HAZARDS

a) **ASBESTOS:** The discovery of any asbestos in the School must be reported to the School Safety Advisor. For handling and disposal of asbestos See Safety Policy and Local Rules for Work with Asbestos in University Buildings (SSC-48-3). To become SPG-07.

b) **HUMAN or ANIMAL BLOOD or OTHER BODY FLUIDS and Tissue:** Work undertaken with human or animal blood, blood products or tissue is governed by the University Safety Procedures and Guidance SPG-25 for Work with Human or Animal Blood Samples, Human or Animal Blood Products and other Specimens of Human or Animal Origin, Formally SSC-78-3. Contact the safety office before commencing work.

c) **CARCINOGENS, MUTAGENS and TERATOGENS:** See Safety Procedures and Guidance for the Control and Use of Carcinogenic, Mutagenic and Teratogenic Substances SPG-10 (Formally SSC-60-1).

d) **CENTRIFUGES:** Those working with centrifuges must read and be familiar with the Safety Procedures and Guidance SPG-03 for the Safe Operation of Centrifuges (formally SSC-22-9).

e) **ELECTROPHORESIS APPARATUS:** Advice on the safe operation of electrophoresis apparatus is set out in the University Safety Procedures and Guidance for the Safe Operation of Electrophoresis Apparatus SPG-21(formally SSC-75-1). Supervisors should ensure that a suitable risk assessment is undertaken before experiments involving electrophoresis are undertaken. The School Electronics Workshop staff must approve the design of any new electrophoresis power packs or apparatus before they are bought into the School

f) **GENETICALLY MODIFIED ORGANISMS:** Managers, supervisors, research workers, technicians and post graduate students working with GMO's must follow the University Safety Procedures and Guidance SPG-29 for the implementation of the Genetically Modified Organisms (Contained Use) Regulations (Formally (SSC-72-1). The Biological Safety Advisor must be consulted before introduction of any new material into the School or before embarking on experiments involving in vitro genetic manipulation

g) **MICRO-ORGANISMS/HUMAN PATHOGENIC ORGANISMS:** No dangerous pathogens (Advisory Group List A Pathogens) must be brought into University premises. Work with other pathogenic organisms must be approved by the University Biological Hazards Sub-Committee or, where genetically modified organisms are involved, by the Genetic Modification Safety Committee. See also Safety Procedures and Guidance for the Control of Biological Agents SPG-24 (formally SSC-78-2).

h) SHARPS

General rules for using syringe/needle assemblies:

- assume any human/animal tissues or products may harbour harmful substances;
- needles should never be left uncapped on a surface or removed from a syringe, unless absolutely necessary;
- needles should not be recapped prior to disposal (directly into a sharps container). This is when the majority of needle-stick injuries occur;
- avoid generation of infectious aerosols unless appropriately contained

XV DISPOSAL OF WASTE

All waste materials must be disposed of in a safe manner.

See Safety Procedures and Guidance SPG-14 Disposal of waste Chemicals and SPG-33 Non chemical/biological Waste

Also there are a number of other Safety Procedures and Guidance document which give details of disposal of specific waste:-

SPG -05 for Working with Radioactive Materials and Ionising Radiation

SPG-10 for the Control and use of Carcinogenic, mutagenic and Teratogenic Substances

SPG- 25 Work with Human Blood Samples, Human Blood, Products & other Tissue Specimens of Human Origin

SPG-29 for the Implementation of the Genetically Modified Organisms (contained use) Regulations

SPG-07 for Work with Asbestos in University Building

SPG-04 Code of Practice for Safe Working with Laboratory Glassware

Disposal of all chemicals, biological and other hazardous material used in projects and research work must be detailed in any risk assessment or COSHH hazard assessment.

XVI NOISE

It is the policy of the University to reduce noise levels, as far as is reasonably practicable, to 80 dBA or less. Managers and supervisors must ensure compliance with the University Safety Procedures and Guidance SPG-12 for implementation of the Noise at Work Regulations 1988 (formally SSC-61-5).

XVII OCCUPATIONAL HEALTH SERVICE

The Occupational Health (OH) Service is an independent, contracted service to the. A Consultant in Occupational Medicine and a counsellor are available for one session a week, and a back care advisor for one day a week. The office is open Monday to Friday, throughout the year. (Closed bank holidays). Hastings Building. Extension 7255.

The aims of the service are to:

- provide a confidential OH service to all University employees
- promote employee health and well being
- ensure that work or the working environment does not adversely affect employee health
- promote safe working practices
- promote the rehabilitation of previously sick and injured employees back to work
- assist in risk assessments of the workplace
- act as a resource.

Services provided include pre-employment health screening, management referrals for sickness absence advice, health surveillance (e.g. lung function tests, hearing tests), return to work review, maintenance of confidential OH records, counselling and provision of vaccinations required for work purposes.

Self referrals are welcome and the OH Advisor, will be pleased see any member of staff to discuss, in confidence, any work-related occupational health and safety matters causing concern.

XVIII VEHICLES

Refer to the Safety Office web page and the University Driving at work Policy.

Before using any vehicle ensure that it is roadworthy:

Tyre pressures are correct.

Tyre tread depth is legal.

Lights and indicators function.

Check the washers and wipers work.

Ensure oil and water levels are correct.

Ensure the vehicle is loaded safely and not overloaded.

Check the brakes at the beginning of the trip.

Check the documentation:

Check that the vehicle and driver are insured for the trip to be undertaken.

(If you are driving your own car to a conference or field trip, etc, do you have business use cover?)

Check the vehicle has a current MOT and is taxed.

Does the driver have the correct driver's license for the vehicle?

XIX HAZARD & RISK ASSESSMENTS

Under the "Management of Health and Safety at Work Regulations 1992"(MOHSW) it is a legal requirement that all Managers, e.g. Professional service Managers, Heads of schools and departments, Research Supervisors, Teaching Faculty and Technical Supervisors, make assessments of the risks to the health of staff, students, visitors and members of the public who may be affected by the activities being assessed..

Safety Procedures and Guidance documents SPG-17 for the implementation of MOHSW, and SPG-19 for Inspections, Monitoring and auditing give further details, all supervisors are required to be familiar with them.

- (a) Under the above regulations there is a LEGAL requirement to assess the risk associated or posed by any 'work' carried out which is liable to expose any persons to substances or operations which are hazardous to health. It might well be that the hazard/risks associated with the work envisaged are of such a low order that a written assessment would be overstating the obvious, but one **must** be able to report to the enforcing body that the process of hazard/risk assessments has been undertaken.
- (b) The copies of completed form must be lodged with the School Safety Coordinator prior to any work being undertaken.
- (c) Each research laboratory must provide a file labelled "Hazard/Risk Assessment Documents". Copies of all documentation pertaining to Hazard/Risk Assessments in that laboratory must be stored in this file and prominently displayed in the laboratory.
- (d) Every Hazard and Risk Assessment must contain information on the hazards, e.g. electricity, high pressure, laser radiation. The risk to health must be outlined together with the preventive and protective measures to be taken. The assessment must clearly also deal with the risk to health due to the toxicity of the chemicals involved as well as their reactive risks e.g. fire/explosion.
- (e) Student Supervision. Faculty are responsible for the supervision of students. This includes not only the writing of the above assessments etc., but also making the students aware of them and supervising the students to ensure that they are followed. This covers all laboratories, not just research.

Appendix 1

SAFETY PROCEDURES AND GUIDANCE DOCUMENTS

New number	old number	
SPG-01	N/A	Local exhaust ventilation
SPG-02	SSC-22-7	Code of practice for workshops, workshop equipment and tools
SPG-03	SSC-22-9	Safe operation of centrifuges
SPG-04	SSC-42-1A	Code of practice for the safe working with laboratory glassware
SPG-05	SSC-48-1	Working with radioactive materials and ionising radiation
SPG-06	SSC-48-2	Control and use of X-ray equipment
SPG-07	SSC-48-3	Work with asbestos in university buildings
SPG-08	SSC-56-2	Work with lasers
SPG-09	SSC-59-5	Control of poisons & regulated chemicals
SPG-10	SSC-60-1	Control and use of carcinogenic, mutagenic and teratogenic substances
SPG-11	SSC-61-1	Working Outside of normal working hours
SPG-12	SSC-61-5	Guidance for the implementation of the Noise at Work Regs
SPG-13	SSC-61-6	Implementation of the Electricity at Work
SPG-14	SSC-69-5	Disposal of waste chemicals
SPG-15	SSC-72-2	Manual Handling Operations regulation
SPG-16	SSC-72-3	Personal protective equipment
SPG-17	SSC/72/5	Management of H & S at Work
SPG-18	SSC/72/6	Provision and Use of Work Equipment Regulations
SPG-19	SSC/73/1	inspection, monitoring and auditing of the management of H&S at Work
SPG-20	SSC-74-2A	Safe working with microbiological material.
SPG-21	SSC-75-1	Electrophoresis apparatus
SPG-22	SSC/75/2	Workplace (Health, Safety & Welfare Regs') incorporating 'Local Rules for minimising the risk of falls on the level'.
SPG-23	SSC/78/1	Control of Substances Hazardous to Health
SPG-24	SSC-78-2	Control of biological agents (Control of Substances Hazardous to Health)
SPG-25	SSC-78-3	Human and animal blood, products and tissue samples & specimens
SPG-26	SSC-79-1	Guidance for safety in fieldwork
SPG-27	SSC-80-1	Safe working practices for Grounds staff.
SPG-28	SSC/81/1	Pesticides policy and local rules
SPG-29	SSC-82-1	Genetically Modified Organisms .
SPG-30	SSC-85-1	Guidance for compliance with the Confined Spaces regulations
SPG-31	N/A	Disinfection
SPG-32	n/a	Emergency spills procedure
SPG-33	n/a	Non Chemical/biological waste
SPG-34	n/a	Gas cylinders, compressed gas and cryogenic "gases"
SPG-35	n/a	Pressure systems

This list is subject to change with new Documents to be added, check with the web site and your safety Coordinator.

List of University of Sussex Safety Policies.

Asbestos Management Policy

Control of Hazardous Substances Policy

Display Screen Equipment (DSE) Policy

Driving at work Policy

Environmental and Sustainability Policy

Fire Policy

Food Safety Policy

Health and Safety Policy

Lone Working Policy

Manual Handling Policy

Management of Contractors Policy

Prevention and Management of Violence Policy

Radiation Policy

Smoking Policy

Waste Management Policy