Imperial College London

Health and Safety Matters

OCCUPATIONAL HEALTH & SAFETY NEWSLETTER

Issue 22
December 2010

*i*Care
Control the situation
Assess the hazards
Reduce the risk
Educate staff & students

Inside this issue:

COLLEGE UNDERGOES EXTERNAL HEALTH AND SAFETY AUDIT

During the last month, an external audit of health and safety has been undertaken at the request of the College Secretariat. The audit was carried out by HASTAM and the purpose was to check the College's progress against implementation of it's health and safety management system (HSMS) and previous external audit recommendations. Over fifty College staff including the Rector were interviewed during the two week period the auditors spent at the premises.

Once the full report has been accepted by the College and the management response appended, further details will be made available. In the meantime we are pleased to report the following from the audit summary, noting that as always the goal-posts tend to move with respect to health and safety:

"The audit objective was to assess the College's level of progress in implementing the HSMS and associated processes and to comment on its effectiveness in delivering improved standards of safety.

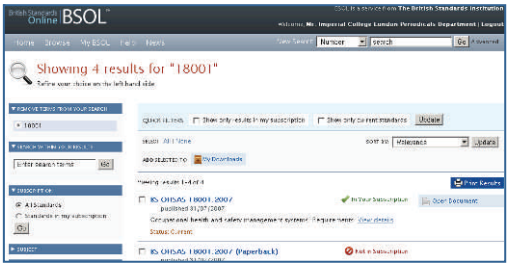
The internal audit criteria related to risk assessment and control, accident investigation, performance monitoring, including inspection, and audit.

The level of progress in implementing the HSMS varies from Faculty to Faculty and from Department to Department, but overall findings were that the College had made significant improvements in health and safety management since the previous audit and that the College HSMS was broadly compliant with the HSE's Successful Health and Safety Management (HSG65). However, since the previous audit there has been a significant development in safety management in that there is now a recognised British Standard BS OHSAS 18001 Occupational Health and Safety Management Systems - Requirements. In HSMS terms, the College does not, in many respects, meet these new requirements and relevant issues are addressed in the recommendations"

In response to the audit, the College will develop an implementation plan, and further details of the report, management response and planning will be made available in the near future.

For those who are interested, British Standard BS OHSAS 18001: 2007 may be downloaded from BSOL (British Standards Online) free of charge by virtue of the College subscription:
https://bsol.bsigroup.com/en/BsolHomePage/

The BSOL site should recognise College computers by IP address and no passwords etc. should be necessary. Further information is given on the College Library website:
http://www3.imperial.ac.uk/library/find/databases/bsionline



Access this Newsletter in electronic format at:
http://www3.imperial.ac.uk/safety/otheresources/newsletter

The five minute guide to: *Centrifuges*

The modern laboratory centrifuge is a sophisticated piece of equipment which under normal circumstances is safe to operate. However, many of them, even the smaller bench top centrifuges are capable of generating considerable energies during use and are often used to process hazardous materials. This could pose a risk to the health and safety of users or others if operated by untrained staff, in an inappropriate way or for a purpose other than that for which it was designed.

Selection

Obvious, but select the centrifuge that it is most suitable for the material you want to separate, the site where it is to be located, the services that are available, and the ergonomic requirements of those using and maintaining it (consider the weight of the rotors—some are very heavy). The capacity of the centrifuge should suit the anticipated materials and workload.

The choice of rotor and ancillaries such as sealing lids and buckets should stem from a risk assessment of the hazards presented by a combination of the materials being centrifuged and the potential for additional harm if the material was aerosolised or subject to sudden violent force and heat as a result of a rotor failure.

It is important to liaise with the supplier and provide them with a specification of the normal working conditions of the centrifuge, the type of process you wish to perform, the constraints of the location, together with details of any adverse conditions under which the centrifuge is required to operate, for example if it is intended for use in the field or in cold or humid conditions.

Installation

The surface on which the centrifuge is to be mounted whether this is the floor or a bench top must be strong and stable enough to support the centrifuge, even if there is a load imbalance or a rotor failure. It must also be impervious to any liquids which may be spilt. Doors, stairs and lifts must all be wide enough to accommodate access. The location should be well ventilated to remove excessive heat. A centrifuge generates a lot of heat through friction of the rotor with air which is removed by use of internal fans or a built-in refrigeration system and this heat is usually passed into the room. To simplify transport and containment issues the centrifuges should be sited as close to the point of production of the materials for centrifuging as practicable. In some cases there will be established requirements - centrifuges within biological CL3 facilities must be sited within the laboratory. Those for dealing with HG2 material should be within the suite. When selecting a location it is important that a minimum safety zone of at least 300mm is preserved around the machine. Ventilation ducts should not be obstructed and the centrifuge should be installed in such a manner that allows safe access for maintenance, inspection and operation.

Commissioning

The centrifuge should be installed and commissioned according to the manufacturer's instructions by a qualified and competent engineer. Ensure that instruction manuals are provided at commissioning.

Use

Ensure that staff operating and maintaining the centrifuge are provided with suitable training, and have the necessary skills and knowledge to carry out their job competently and safely. For the larger more complex centrifuges, e.g. high speed, super speed and ultra, the manufacturer or supplier should be approached to provide initial training as part the purchase agreement. The training of staff should be documented. The training key points should be summarised in a suitable document so that future trainers can refer to it and provide an accurate and reproducible standard of training to future users. Before operating the centrifuge, read and understand the operating instructions laid out in the manufacturers user manual and ensure that the manufacturer's technical conditions of use are complied with. Key points for all centrifuges include:

* *The lid lock and any other safety interlocks are functional.*
* *Rotors should be compatible with the centrifuge*
* *Rotors must be firmly attached to the rotor shaft before use.*
* *Maximum rotor speeds and loadings should not be exceeded.*
* *Rotors should be evenly loaded. Critically all buckets in a swing out rotor must carry a load.*
* *Swing out rotor buckets should match the hangers and are often numbered to avoid confusion.*
* *Rotors showing evidence of corrosion, physical damage or that are time expired should not be used.*
* *Untrained staff should not be allowed to operate the centrifuge.*
* *When the centrifuge is running no persons, hazardous substances or objects should intrude within the safety zone of 300mm around the centrifuge. This area should be marked.*

A risk assessment for use of the centrifuge should be available which identifies the hazards arising from the centrifuge itself, the materials to be centrifuged, transport of these materials, manual handling, and suitable precautions and emergency procedures to control the identified hazards. A rotor log should be kept for all super speed and ultra centrifuges which indicates the number of runs that a rotor has undergone, for how long and at what speed.

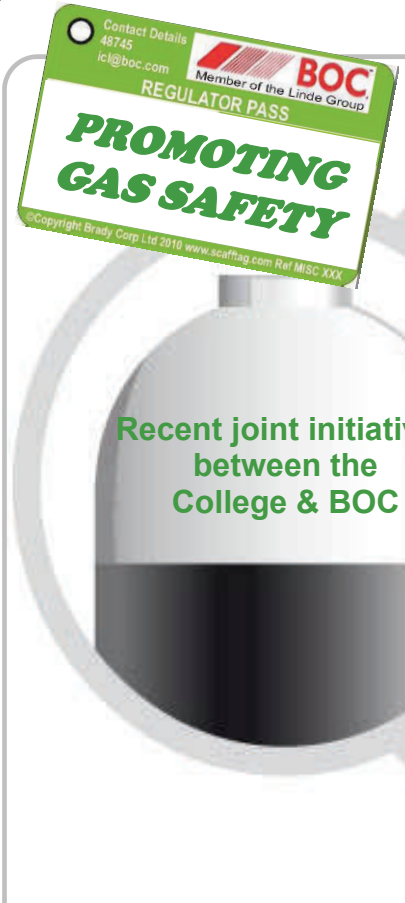
Maintenance

This is a critical part of ownership for all equipment particularly machinery such as centrifuges which pose a recognisable hazard to the user. Maintenance of laboratory centrifuges should be carried out in accordance with manufacturers servicing instructions. As a minimum centrifuges and rotors should be maintained and inspected annually or as indicated by rotor run times, by a competent engineer. Any repairs should only be carried out by a qualified and competent engineer. In addition to the annual inspections, maintenance will typically include a certain amount of user checks such as rotor inspections for cleanliness, signs of damage and corrosion. Users will be required to clean rotors, centrifuge chambers and housings and also inspect bio seals, apply grease to seals, rotor trunions and drive shafts plus any other tasks as required by the manufacturer's instructions. The user should also check the function of any safety devices regularly including interlocks such as lid lock mechanisms. All maintenance should be documented.

Decommissioning

Before your centrifuge ends up as scrap ensure that it is rendered safe for disposal. Remove all tubes and containers and check for hazardous materials. Take appropriate measures to remove all contamination and complete and sign a decontamination certificate to attach to the instrument. The instrument will contain electrical components and must be disposed in a responsible manner in compliance with WEEE Regulations. Manufacturers may operate a rotor part exchange system as some are made from precious materials such as titanium.

Ian Hackford



Recent joint initiatives between the College & BOC

* Modification of the Excel spreadsheet that BOC use for recording the results of annual inspections to include more information on why a regulator has failed an inspection and additional information on which research group owns the regulator and the identity of their safety officer.

* Instigation of an annual report listing all departments (by building location), the number of regulators recorded within each, the number failed and the reasons for failure. A timetable of inspections for the coming year will also be produced (see below).

* A commitment to explore new methods such as barcoding to speed the transfer of inspection results to those who need to know the outcome so that appropriate action can be taken.

* Introduction of a new sticker to be appended to the red BOC 'immediate replacement required' label to make it clearer in cases where it is considered that imminent danger exists.

TIMETABLE OF BOC PRESSURE REGULATOR INSPECTIONS 2011

Ace & Bone Buildings (South Kensington)	July & August
Aeronautics Department (South Kensington)	May
Charing Cross Campus	April
Chelsea & Westminster Campus	February
Chemistry Department (South Kensington)	November & December
Flowers Building (South Kensington)	October
Hammersmith Campus	June & July
Harefield Campus	May
Kennedy Institute	April
Mechanical Engineering Department (South Kensington)	January
NHLI	August
NMR (South Kensington)	January
Northwick Park Campus	September
Physics Department (South Kensington)	August
SAF Building (South Kensington)	October
Silwood Park Campus	September

Any enquiries regarding the timetable should be addressed to Mark Komorowski: Mark.Komorowski@BOC.com

Safety Department and Occupational Health Service News

Machinery Risk Assessment

A new machinery risk assessment form has been devised and is now available on the Safety department website. As with all new risk assessment tools, comments and feedback are welcome:

http://www3.imperial.ac.uk/safety/formsandchecklists/raforms1

DSO Appointment Letter

A standard template DSO appointment letter has been drafted and uploaded onto the Safety Department website. As it relates to safety management, it is accessible from the *Health and Safety Responsibilities* section under both the *Head of Department* and *Departmental & Divisional Safety Officers* sub-sections:

http://www3.imperial.ac.uk/safety/policies/organisationandarrangements/headsofdepartmentdivisions

and:

http://www3.imperial.ac.uk/safety/policies/organisationandarrangements/departmentaldivisionalsafetyofficers

Test your health and safety knowledge…….

What is the Workplace Exposure Limit for carbon dioxide?

A). 0.5%

B). 1.0%

C). No Workplace Exposure Limit assigned

Answer on Page 7.

COSHH and Occupational Health Service Health Assessment

Some chemical risk assessments need to be passed to the College Occupational Physician for comment before they can be signed off. This applies to *any* work with chemicals classed as reproductive toxins or to some work with chemicals than can provoke allergic reactions, genetic damage or cancer if the work is scored as high risk on the risk evaluation matrix of the *COSHH* form. The chemicals can be identified by their standard risk phrases in the information box below.

The purpose is to assess the potential for exposures sufficient to cause illness that may occur during the course of the work. Repeated exposures to very small amounts of these types of hazardous agents, insufficient to cause any acute reaction can eventually result in serious damage to health. Where this could occur, some form of health monitoring may be needed or, for reproductive toxins, women who are, or who may be, pregnant may need to avoid working with the chemical.

The health risk assessment requires more information than is collected on the *COSHH* form. If you need to pass a risk assessment to the Occupational Physician for comment, provide details on the precise amount of the chemicals that will be used at any one time, as well as information on how often the work process is carried out.

Most health risk assessments conclude that the safety controls specified in the risk assessment, along with good laboratory practice will be sufficient to prevent hazardous exposures.

Risk Phrases

Allergy

R42 May cause sensitization by inhalation
R43 May cause sensitization by skin contact

Cancer

R45 May cause cancer
R46 May cause heritable genetic damage
R48 Danger of serious damage to health by prolonged exposure
R49 May cause cancer by inhalation

Reproductive toxin

R47 May cause birth defects
R61 May cause harm to the unborn child.
R63 Possible risk of harm to the unborn child.
R64 May cause harm to breastfed babies

Be aware that these Risk Phrases have started to be superseded by 'H' type Hazard Statements (see article on the Globally Harmonised System on Page 5).

THE GLOBALLY HARMONISED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)

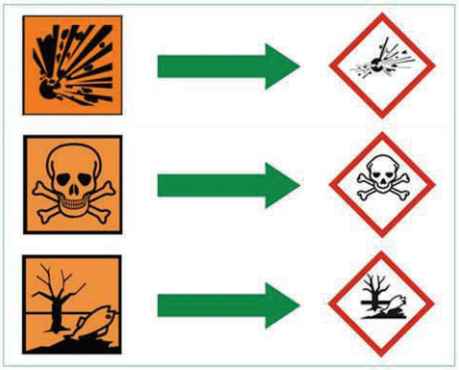
Staff who are actively engaged in COSHH assessments may be aware that measures are already afoot to implement a global system for the classification and labelling of chemicals. The purpose of the exercise is to address the historical discrepancies that have existed with regard to different countries classifying and labelling chemicals in different ways—for example, the same chemical could be classified as toxic in one country but not in another. As a result, the UN has brought together experts from different countries to create a unified system that goes by the grand title of this article.

In the European Union, the GHS criteria has been enshrined in a new European Regulation *(EC) No.1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures* (CLP Regulation). There is a transitional period for the introduction of the Directive and full implementation is not scheduled until 2015. The next milestone however, is 1 December 2010 by which time suppliers must classify substances according to both CHIP (current UK Regulations) and CLP and label and package in full accordance with CLP. The *Chemicals (Hazard Information & Packaging for Supply) Regulations* [CHIP] will be amended as the transitional period progresses and will be repealed in June 2015 when CLP comes fully into force. So its all perfectly clear!

Enough of the background….what does it actually mean to the safety officer and the researcher in the laboratory? As with REACH (see article in March 2009 issue), responsibilities tend to fall on the manufacturer or supplier, but we will see changes in the way chemical bottles are labelled and the information that is found in Material Safety Data Sheets (MSDSs). This is already happening.

New pictograms

The design of the pictograms are changing from the orange square type to red-bordered diamonds (as per the examples below taken from the HSE web pages).



The new diamonds more closely resemble the transport labels that are affixed to the transport packaging—these incidentally, are not changing, so you will still see them on outer packaging.

There are also one or two new pictograms that have not appeared before:

The human head and torso figure that represents serious longer term health hazards such as carcinogenicity or respiratory sensitisation

The exclamation mark that represents less serious health hazards such as skin irritation—this will often equate to the old CHIP symbol: 

Other things that will start appearing on labels include the contact details of the suppliers and hazard statements, precautionary statements and signal words—this information will be mirrored in the MSDS.

Hazard Statements

These will be of the type: *H340 May cause genetic defects* and will replace the familiar Risk Phrases such as *R46 May cause heritable genetic damage*. For a while, both will be provided. The HSE have published details of which 'H' statements equate to which 'R' phrases in *The technical basis for COSHH essentials: Easy steps to control chemicals* (free on the HSE website).

Precautionary Statements

These will be of the type: *P281Use personal protective equipment as required* and will replace Safety Phrases such as *S36/37 Wear suitable protective clothing and gloves*. Again, both will be provided during the transition period.

Signal Words

These are single words used to indicate the relative level of severity of hazard. The two GHS signal words are '*Danger'* (more severe) and *'Warning'* (less severe). For those who are interested, there is further information on how the pictograms, hazard statements and signal words relate to each other on the UNECE website.

ACUTE TOXICITY: INHALATION				
Category 1	Category 2	Category 3	Category 4	Category 5
				*No pictogram*
Danger	Danger	Danger	Warning	Warning
Fatal if inhaled	Fatal if inhaled	Toxic if inhaled	Harmful if inhaled	May be harmful if inhaled

The Safety Department will be updating COSHH guidance in due course and, unsurprisingly, there is a wealth of further information on GHS on the web...but be warned—it can be heavy going.

HSE: http://www.hse.gov.uk/ghs/

European Chemicals Agency: http://echa.europa.eu/clp_en.asp

United Nations Economic Commission for Europe (UNECE): http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html

Accidents & Near Misses

Learning Lessons

We shall look at a mini case study for this edition:

An incident occurred recently involving exposure to a biological agent—*Legionella pneumophila*. The incident occurred when a culture plate came loose during centrifugation resulting in release of the culture inside the machine. The centrifuge lid was subsequently opened, hence putting the operator at risk of exposure. In many ways, the incident illustrated some common causation factors:

The existence of written protocols but deviations observed in practice
Local rules and risk assessments stipulated the conditions for centrifugation—yet there was no mention of using culture plates in this documentation.

Incorrect operation of the equipment
The centrifuge rotor was loaded incorrectly - the plates should have been loaded into a sealed bucket which fitted securely into the swing out rotor arm hangers. This was found to be available, but unused, in a box behind the centrifuge.

A lack of maintenance on the centrifuge
One of the centrifuge rotor arm hangers failed to swing out into the horizontal position during the spin, possibly because it was not lubricated, causing the multi-well plate to dislodge.

Human error— a failure to observe documented emergency procedures
Immediately opening the centrifuge lid contravened the emergency procedures laid down in the laboratory local rules and exposed those in the immediate vicinity to an aerosol of bacteria.

Difficulties arising from shared space and shared equipment
Apart from the operator, two other researchers (engaged on different research projects) standing nearby were placed at significant risk of exposure to aerosol once the lid was opened up.

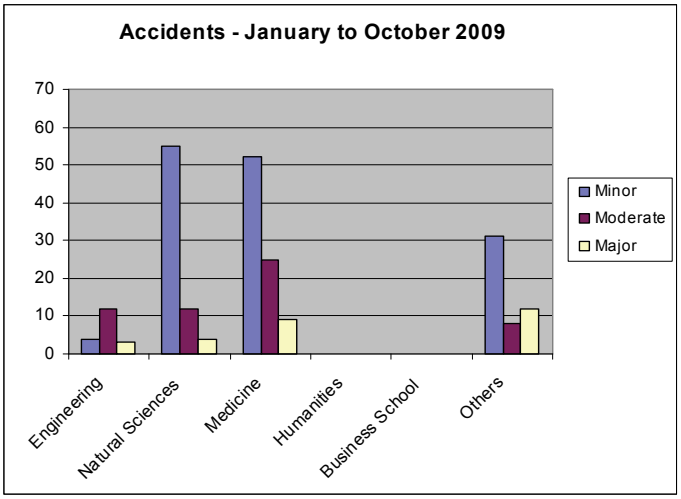
Gaps in on-the-job training
All the laboratory workers involved had attended the basic laboratory safety training provided for new post-graduates and received a basic safety induction. However, there was no recorded training in the use of the centrifuges and no records of any other training on laboratory equipment or in specific work related procedures.

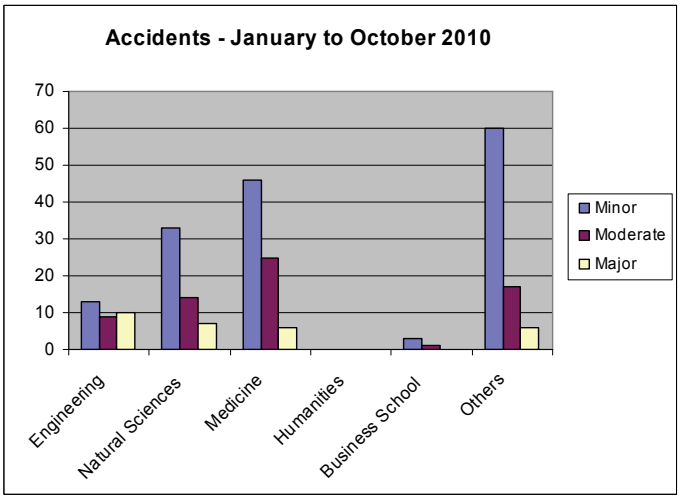
The incident was notified to the HSE under the *Genetically Modified Organisms (Contained Use) Regulations* and is still under investigation. A number of remedial actions are currently being implemented including: improved procedures for inspection and monitoring (including a means of recording that identified actions have been completed); documented maintenance of equipment and improved on-the-job training of staff.

Accident Statistics

	Jan-Oct 2009	Jan-Oct 2010
Total accidents reported to the Safety Department	227	250
Total accidents reported to the Health and Safety Executive in accordance with *RIDDOR 1995*	16	24

Comparison Graphs
January to October 2009 vs. 2010





Accident rating:

Minor: No treatment required / First Aid.

Moderate: Visit to Occupational Health / GP / Health Centre or A&E.

Major: HSE reportable / Lost time (up to 3 days) / member of public taken to hospital for treatment.

FREQUENTLY ASKED QUESTION:

I have a visiting worker coming to work in my department—I understand that the College has insurance and we are therefore covered in the event of any accidents?

We sometimes receive enquiries of this nature and it is surprising how people manage to confuse insurance issues with obligations under heath and safety law. The situation is perhaps best illustrated with a fictitious example.

Scenario: A College department is planning to invite a visiting worker onto the premises to undertake some work in one of the department's workshops. The person duly commences work and suffers an accident whilst working on one of the machines resulting in loss of sight in one eye.

Possible outcome: Firstly, the injured party may conclude that a claim for damages against the College is justified and commences legal action. The College is then in the position that it has to determine what course of action to take in response to the claim and sets about gathering evidence surrounding the incident. In the event that the College is held liable, it has Employers and Public Liability Insurance cover in place to deal with such claims. This is a civil law action and the purpose is to compensate the victim for damages.

Secondly, this was a serious accident and would be reportable to the HSE under the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations* (RIDDOR). The HSE may subsequently decide to investigate the circumstances surrounding the accident. Lets assume that the investigation determines the following (admittedly, a pretty grim list of deficiencies):

- The visiting worker had not been given any form of safety induction before commencing work.
- No risk assessment for his work had been undertaken and his competency to do the job was unverified.
- The machinery guarding was inadequate.
- No arrangements for provision of PPE had been made.

The HSE would have the option of serving an enforcement notice and also has the power to prosecute for a breach of statutory duty. If prosecution follows, this is a criminal law action and the purpose is to punish the organisation at fault. The existence of insurance cover plays no part in these proceedings.

This example is very simplistic, but the take home message is that the existence of an insurance policy does not absolve the College of its statutory duties and the risk of enforcement action, prosecution and possible reputational damage if we do not have adequate procedures in place to address the safety of visiting workers.

Exempt Radioactive Sources—Overlook these at your peril!

The College has many hazardous substances that have statutory regulations for their safe use across the campuses, and for sources of ionising radiations the majority of departments are aware of the significantly higher activity sealed sources they hold. These tend to be easy to manage and control, but one area that is sometimes overlooked are 'exempt' sources of ionising radiations.

What is an 'Exempt' source?
Exempt sealed sources are not required to be registered under a site permit issued by the Environment Agency but they fall under various Exemption Orders. These Exemption Orders are classed into: Natural Occurring Radioactive Material (NORM), Products or Equipment that contain sealed sources and specific applications such as exhibitions and Schools.

Why be concerned with Exempt sources?
Confusion can occur because these sources are not listed on the permit and they therefore tend to be forgotten in terms of management and control. However, each Exemption Order has specific conditions which the user of the source has to comply with, for accounting, up-keep and disposal.

Statutory processes associated with the up-keep of Exempt sources are: maintenance of equipment, calibration and leak testing of the source. A breach in these Exemption Order conditions by the user can result in enforcement by the regulators upon the College. An exempt sealed source tends to be of a low activity with very low radiological hazard, but the College has statutory requirements to account for all sources of ionising radiation. So in terms of failure to account for exempt sealed sources, they carry the same business risk as the higher activity sealed sources.

Know your sources and keep us informed…
The most important step for the management of Exempt sources for any department is to ensure they know about all the sources they hold and inform the College RPO/RPA if they have not been accounted for. For further information on this subject and other ionising radiation matters please consult the College Guidance which can be found at;

Radiation Protection Manual:
http://www3.imperial.ac.uk/safety/guidanceandadvice/ionradiation.

If you have any questions regarding your sealed sources please contact the Radiation Team.

Test your health and safety knowledge (from Page 4)

Carbon dioxide has a long term (8 hour time weighted average) Workplace Exposure Limit of 0.5%. It also has a short term (15 minute) WEL of 1.5%.

Contact Details

Occupational Health

Level 4
Sherfield Building
South Kensington
London SW7 2AZ

PHONE:
0207 594 9401
FAX:
0207 594 9407
E-MAIL:
occhealth@imperial.ac.uk

WEBSITE:
www.imperial.ac.uk/occhealth/

Safety Department

Level 5
Sherfield Building
South Kensington
London SW7 2AZ

PHONE:
020 7594 9423
FAX:
020 7594 9424
E-MAIL:
safety-dept@imperial.ac.uk

WEBSITE:
www3.imperial.ac.uk/safety

If you have any comments or suggestions for inclusion in future Newsletters please contact the editor:

John Luke
Safety Department
j.luke@imperial.ac.uk

Training

Eric Miranda, Learning Development Consultant

The budget for safety training for 2010/11 is £50,000 and we have to ensure that this limited sum is allocated wisely. In order to achieve the best use of our resources we have to allocate places based on College need. We must manage our health and safety training provision based on risk assessment in order to prioritise places.

First Aid Co-ordinators have a role to play in helping us manage this process by using the existing departmental first aid provision tool to decide what level of provision is required within their work environment. This tool will help First Aid Co-ordinators assess and record the department's first aid requirements and frame their request for first aid places. This tool should be used in conjunction with the guidance notes that can be found on the Occupational Health website.
http://www3.imperial.ac.uk/occhealth/guidanceandadvice/firstaidinformation/firstaidprovisiontool

The Security staff at the College are first aid trained and can attend and provide back up support to departments across campuses. The NHS Trust can provide cover in the medical campuses. First Aid Co-ordinators will need to consider their requirements based on average occupancy during college working hours. As a general guide:

First Aid at Work Qualified (FAWQ 3 days): 1 per building and 1 per additional 200 occupants.

Emergency First Aid at Work (EFAW 1day): 2 for the first 50 occupants and 1 per every additional 100 occupants.

However, First Aid Co-ordinators must take into account the work hazards, layout and multiple floors of a building so as to ensure that a first aider can reach an incident. The guidance document recommends at least 1 EFAW qualified person per floor, unless there are less than 30 people occupying the area. Consideration should be given for joint cover arrangements between departments who can help share cover in a building.

The Learning Development Centre (LDC) will run 17 EFAW courses and 5 FAWQ courses in the 2010/11 programme but First Aid Co-ordinators must ensure that their first aiders attend refresher courses to avoid skills decay and re-qualify before their 3 year qualification expires. We have offered 8 First Aid refresher (half day) courses but the uptake has been poor. Furthermore, there are 5 FAW Requalification (2 day) courses, but we have had a number of requests made after qualifications have expired. This represents poor value for money because we have to ask delegates who wish to remain first aiders to attend a full 3 day course again to comply with the First Aid Regulations.

Although first aid courses are offered cost free to departments the LDC does spend a considerable sum in bringing in external trainers, arranging catering and venues.

To make the best use of our resources we will be reminding First Aid Co-ordinators to use this risk assessment tool.

training schedule & events

Below is a selection of forthcoming courses. The complete list for this term is too comprehensive to include here—please consult the training programme link for the entire range: https://www3.imperial.ac.uk/staffdevelopment/safety/index.htm

January 2011		February 2011	
CIEH Level 3 Award in Health & Safety in the Workplace *(South Kensington)*	18th, 25th & 1st Feb	Fieldwork Personal First Aid *(South Kensington)*	9th
Ensuring Laser Safety *(South Kensington)*	19th	Asbestos Awareness *(South Kensington)*	10th
Introduction to Laser Safety *(South Kensington)*	26th	Health & Safety Responsibilities for Academic Supervisors *(South Kensington)*	23rd
Biological Safety Foundation Training *(South Kensington)*	27th	CIEH Level 2 Award in Health & Safety in the Workplace *(South Kensington)*	24th

Next issue of Health and Safety Matters: March 2011