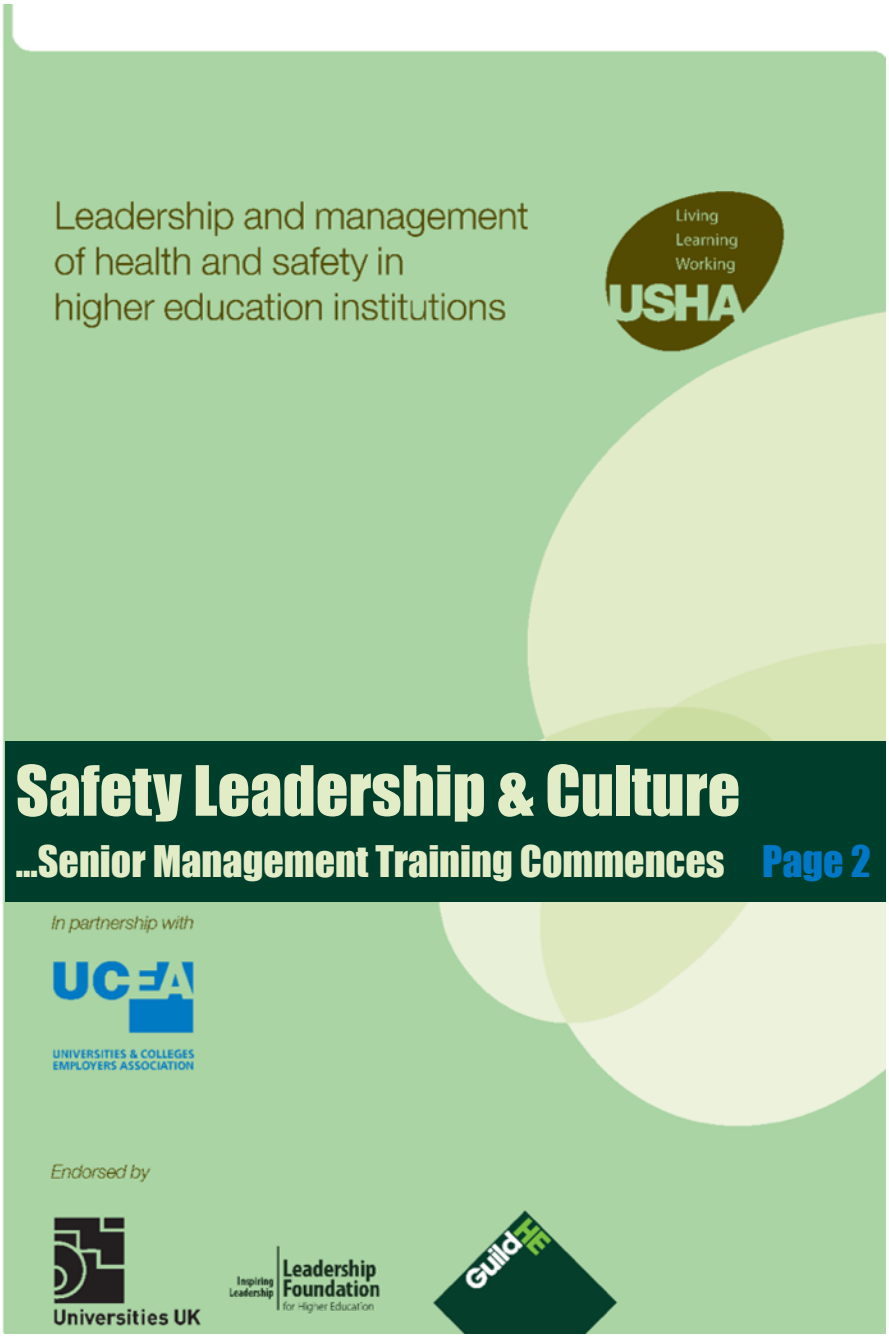
Imperial College London

Health and Safety Matters

December 2016



Page 2

Safety leadership training
Programme commences

Page 3

Waste
The need for correct segregation

Page 4

Learning from incidents
Chemical fires and sharps injuries

Page 5

News snippets
Including new safety induction film and international road travel reports

Page 6

Radiation protection training
Developments in online training provision

Page 7

Using PPE in photography
New guidelines

FAQ
Mixing waste chemicals

Page 8

Safety Training
Latest update

Access Health and Safety Matters in electronic format at:
http://www.imperial.ac.uk/safety/safety-by-topic/health-and-safety-matters-/

Safety Leadership and Culture

Surrinder Johal, College Safety Director, explains the background to the current programme of leadership training

Every organisation desires safe operations, but the challenge is to translate this desire into action. Written rules, standards and procedures while important and necessary, are not enough. The College must develop a culture in which the value of safety is embedded in every level of its activity.

Safety culture can be seen as the unwritten standards and norms that shape mind-sets, attitudes and behaviours. This culture will be passed on to newcomers and has strong effects on peoples' conduct even when they are alone; free from the scrutiny of managers, supervisors or co-workers. Recent reviews and meta-analyses of empirical safety research reveal that leadership has emerged as a primary antecedent of 'safety climate'.

A strong safety culture is not in itself an absolute guarantee against accidents and incidents, but it is a barrier against the complacency, omissions and violations which are commonly listed in investigation reports as causal factors. A health and safety management system that is not backed-up by a positive culture may not give the desired outcomes, as it is what actually goes on at the College daily to get the work done that counts. It is the value of safety within local team environments that is paramount and not necessarily what happens at College level.

A manager's style of leadership and visible demonstration of their commitment to safety through actions is important in shaping the organisation's culture. Evidence shows that what a leader 'does not do' matters just as much as what they do. It shows that there is no neutral position when it comes to safety; passive leaders who do nothing, because they are under pressure to deliver, have a negative effect which is far greater than the negative impact of not being positive; resulting in less compliance and proactivity.

Creating a strong and sustainable safety culture takes time and effort; it is typically a multi-year process. The new safety strategy (see link opposite) has been developed to aid this process and one of the key initiatives is to address safety leadership. A leadership training programme has been developed, specifically targeted at raising management's awareness of health and safety responsibilities within the context of their own particular role. The benefit of the programme is three-fold:

- To understand the legal framework relevant to their role;
- To understand the day-to-day implications of the legal duties
- To identify how those duties can be met and confidence achieved.

The training utilises the experience of specialist health and safety lawyers Eversheds and is structured to be delivered from the 'top down'. Members of the Provost's Board were the first to receive safety leadership training as they play a key role in leading the initiatives towards better health and safety management. Following this, four further days of training were held in November for the next tiers of management. The design of the course focuses on leadership responsibilities and where other establishments have gone wrong. It provides experience of being interviewed under caution and associated evidential requirements. Real-life scenarios and examples from the College are used.

To-date, positive feedback has been received from the attendees following the sessions that have taken place. Further training is planned for 2017 and if you or members of your team would like to attend this training please contact Sangita Kerai: s.kerai@imperial.ac.uk.

WHAT SHOULD MANAGERS BE DOING?

Research by Dr Sara Guediri (Alliance Manchester Business School) has shown that the following actions by managers are positively linked to individuals behaving safely:

- ✓ Speaking about safety in all sorts of situations
- ✓ Acting safely - role models
- ✓ Focussing on maintaining safety standards, especially when faced with other pressures
- ✓ Engaging others in safety initiatives
- ✓ Recognising and rewarding safety

The College Safety Strategy can be found at: http://www.imperial.ac.uk/safety/safety-by-topic/safety-management/safety-strategy/

Waste segregation

Nic Dent, College Waste & Recycling Manager, looks into the issues

There have recently been a number of reports of unusual items in general waste bins in labs. In each of these cases the items have been innocuous, which implies that good choices are being made in disposing of hazardous wastes, but this might be a good time to remind lab users that only items appropriate for general waste should be placed in the general waste bin. In most cases this will generally be hand-towels, plastic packaging and uncontaminated disposable gloves. Have you assessed your waste recently?

It is definitely good practice to keep expenditure low by disposing of waste as cost effectively as possible but we also have a duty of care to ensure that we are not exposing anyone to harm who may handle the waste as it makes its way for processing. We must ensure that we protect our cleaning team, our waste contractors and the environment. Collection of general waste from labs requires a certain amount of trust from the cleaning team; is that glove contaminated or not? When placing a large or unusual item in the general waste (that the cleaning team is bound to notice), it would be helpful to write on the item that it is non-hazardous to provide some reassurance to the cleaning team and ensure that this trust is not eroded.

What are good practices for dealing with waste?
We have an obligation to apply the waste hierarchy to our waste and make sure we make the best use of it – reuse over recycling, recycling over recovery, recovery over incineration and incineration over landfill. It is vital that we recycle as much as possible, diverting waste away from landfill.

Here are some considerations to help achieve the objective of the waste hierarchy:

Avoid packaging being contaminated
Best practice for deliveries to labs would be to unpack items outside the lab so that the cardboard can be recycled without entering the lab and risk of contamination. Also, by segregating the waste items this avoids leaving waste packaging in the corridor (which creates a fire risk) and ensures that the cleaners do not remove anything which has accidentally been left in a box. This serves to reduce our impact on the environment.

Avoid fire risk
Place the waste in the appropriate bin rather than leave it lying around in the corridor where it is a trip hazard and fire risk.

Avoid losing valuable equipment
There have been instances of valuable equipment being left amongst waste packaging; by sorting the waste properly, the risk of losing valuable components can be eliminated, too.

Reuse/recycle those items in the lab that you can
There are a few wastes from labs which can be reused or recycled:

☑ **Pipette tips (unused)**
Companies such as *Starlab* and *Anachem* will collect and recycle these.

☑ **Reagent bottles**
There are grey crates in many labs where reagent bottles can be returned to the producer and recycled (or reused - depending upon the bottle producer). Bottles should be clean, whole with the caps removed to ensure that any residues had evaporated.

☑ **Empty chemical drums**
These can be recycled.

☑ **Gas cylinders**
Can be reused and should be returned to the supplier.

Waste Electrical and Electronic Equipment (WEEE)
All electrical items must be recycled by law. If these have come from a lab then appropriate steps should be taken to decontaminate the items and a decontamination certificate completed. Even if no decontamination steps are required the certificate should be completed to declare the item safe for handling. Batteries and Printer Cartridges are also classed as WEEE and there are bins around the College for these.

Ensure hazardous (or potentially hazardous) items are dealt with appropriately

Broken lab glass
Clean, broken glass from labs cannot be recycled with domestic glass as the materials and melting points are different. There is also risk of dry residues on broken glass. That, and the fact that it looks like it has come from a lab would raise questions about how safe it is from our contractors so this is best disposed of separately by our hazardous waste specialist.

Contaminated glass
Contaminated glass should be disposed of in a sharps container.

Hazardous/Chemical waste
The College has an established chemical waste disposal route via the Estates Customer Services Centre. The request for disposal for should be completed with as much information as possible to describe the waste and its hazards.

Clinical waste
Pre-treat clinical waste onsite wherever possible and ensure it is packaged and tagged appropriately. When transporting clinical waste it is good practice to plan for the event of spillages by ensuring the waste is double contained; sack inside wheelie bin/solid base and sided trolley.

Waste Directory:
www.imperial.ac.uk/wasteandrecycling/

Hazardous Waste:
https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/waste/

LEARNING FROM INCIDENTS

Leaning from incidents is an essential element of reactive safety management. As such, we plan to make this subject a regular feature of future editions of Health & Safety Matters as a means of publicising particular cases, and will attempt to focus on those issues that have College-wide implications. In this edition we look at two current topics.....chemical fires and sharps injuries.

Example 1: Chemical fire

The issue:

Chemical fires are an innate risk in chemistry labs, particularly where pyrophoric substances are in use (substances liable to ignite spontaneously on exposure to air). A chemical fire recently occurred inside a fume cupboard when pyrophoric compounds were being prepared for destruction. The samples were being manipulated under atmospheric conditions rather than inert conditions normally employed for the task. The sample ignited and, in turn ignited a solvent mixture that was to be used for quenching. Researchers attempted to put out the fire using a CO_2 extinguisher (CO_2 can react with certain substances). This failed, and a dry powder extinguisher was successfully employed. On investigation, it was determined that the researchers deviated from an established SoP in the belief that they perceived the risk to be lower as they were using smaller quantities of substances, hence omitting the inert conditions step. They were also short of time.

Learning outcomes:

1. Do not deviate from SoPs - they exist for a reason.
2. Plan experiments properly and allow enough time for completion.
3. Do not cut corners and omit important steps on the grounds that the risk may be perceived to be lower if using smaller quantities of substances.
4. Consider whether substances can be disposed directly via the hazardous waste system without undertaking measures to render them 'safe' before disposal, particularly if this process may introduce additional risks.
5. Ensure that risk assessments and SoPs for higher risk activities are suitably reviewed by a competent individual(s) before undertaking the work.
6. Ensure that suitable fire-fighting equipment is provided for the nature of the fire risk that is likely to arise.

Example 2: Sharps injury

The issue:

Sharps injuries have historically been one of the commonest accidents reported in the College and we are still seeing a steady number. A recent accident saw a member of staff cut themselves on a hidden shard of glass whilst reaching inside a laboratory glassware washer to retrieve a piece of tape. First aid was administered but the injured person remained concerned that there was glass in the wound. This was confirmed when the person visited hospital some time after the event. The piece of glass was surgically removed. The person was subsequently absent from work for over seven days, making the incident reportable to the HSE under the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations* (RIDDOR). Following investigation, it transpired that minor cuts and near misses occurred from time to time but were not routinely reported and investigated. Locally, there was a culture of minor cuts being sustained considered as being 'part of the job'.

Learning outcomes:

1. Don't accept minor injuries as being 'part of the job'. Nobody should come to work at the College with the expectation of getting injured.
2. Report minor injury accidents and near misses - particularly where there is a pattern of recurrence.
3. Check for broken glass and consider whether there is a means of removing and disposing of broken fragments safely e.g. by using snub-nosed tweezers.
4. Consider provision of suitable PPE (hand protection).
5. Appreciate that safety doesn't have to be complicated. These are simple hazards with simple controls.....that have the potential to prevent cuts and puncture wounds that are sometimes serious enough to warrant visits to the hospital or health centre.

*Acknowledgement to the Faculty of Natural Sciences H&S Team for investigating these issues and sharing the outcomes

News Snippets

Student Safety Induction Film

The Safety Department, with the aid of a professional filming company, have produced a safety induction video for students. There are two versions of the film - one for undergraduates and one for postgraduates and each has a slightly different bias (though there is also significant overlap in the contents). The films are approximately fifteen minutes long.

The two films have been made available to the academic Faculties (via their local safety staff) so that they can be incorporated into local induction procedures. The Faculty of Natural Sciences has recently utilised the films for the October inductions and the feedback has been favourable. In the longer term, consideration will be given as to how to take a more co-ordinated approach to making the films available i.e. making them part of an electronic 'welcome pack' for new students.

Association for Safe International Road Travel (ASIRT)

For those who are intending to drive abroad on College business, information on expected road conditions, regulations and other requirements for individual countries can be obtained from the road travel reports created by ASIRT which can be accessed via their website. The reports have been created by academic travellers specifically for academic staff and students travelling abroad and are updated every couple of years. ASIRT is an international organisation, so the reports are not always written using UK terminology. The ASIRT website can be accessed from the Safety Department driving web pages: http://www.imperial.ac.uk/safety/safety-by-topic/driving-on-college-business/driving-abroad/


ASIRT

ASSOCIATION FOR SAFE INTERNATIONAL ROAD TRAVEL

ROAD TRAVEL REPORT: KAZAKHSTAN

KNOW BEFORE YOU GO…

- Travel from one province to another in Kazakhstan or to neighboring nations can be subject to lengthy delays or disruptions.
- Funds budgeted for road maintenance have increased sharply in recent years. Road safety is a component of foreign aid-sponsored road projects.
- Public transportation is poorly developed.
- Personal vehicles account for about 86% of the vehicle fleet.
- Car ownership increased almost 29% from 2006 to 2007. Many cars are imported, and a high percentage of imports are 7 years old or older.
- Road crashes involving severe injury and/or death are common.
- Road crashes increased 10% in 2006 compared to 2005. Almost 15% of the crashes involved children.
- There are 20 road fatalities per 10,000 motor vehicles in Kazakhstan, compared to 3.0 in the Czech Republic, 2.0 in the United States and 1 in the UK.

ROAD REALITIES

DRIVER BEHAVIORS

- Drive defensively; many local drivers do not obey traffic laws.
- Drivers often ignore lane markings.
- Road rage may be a problem, especially in Almaty and the surrounding area. A non-confrontational response

GENERAL ROAD CONDITIONS

- Kazakhstan has an adequate network of main roads, linking all regions.
- Roads are often in poor condition, especially in rural areas.
- Many roads are potholed; some are dangerously deep.

Improvements to Liquid Nitrogen Facilities

Faculty funding has now been secured for implementing improvements to a number of rooms College-wide where liquid nitrogen is used. Acting upon data initially provided by Faculties, further surveys have recently been carried out to determine the exact nature of ventilation improvements and locations of oxygen sensors and alarms specific to each room. Orders will be produced shortly to enable works to commence.

Chemical Exposure Studies

The Safety Department have recently acquired some new monitoring equipment to enable the detection of airborne contaminants (gases and vapours).

We now have two Photo Ionisation Detection (PID) monitors that are capable of detecting a broad range of volatile organic compounds (VOCs), two Crowcon hydrogen sulphide detectors and a new mercury 'sniffer' to replace our ageing one. These compliment our existing monitors for detecting low oxygen and formaldehyde. We have the capacity to undertaken both personal monitoring and fixed-point monitoring.

We have recently undertaken some measurements for both the Chemistry Department and Materials, looking into issues such as background measurement of acetone vapours in a laboratory, atmospheric levels of toluene (where used as a cleaning agent), dichloromethane (solvent being removed using a rotary evaporator) and dimethyl formamide in the vicinity of solvent towers.

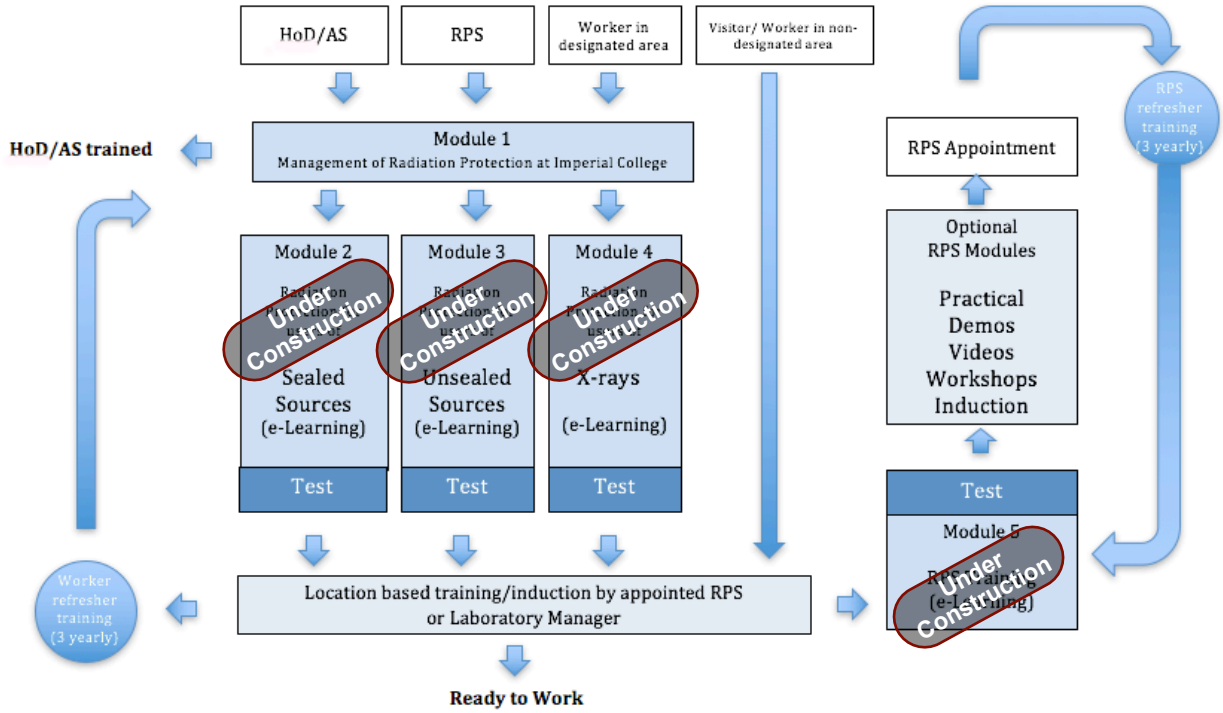
If you have concerns about exposure to chemicals in your work area or would just like reassurance that your control measures are working as expected, then contact Eddie Hartrick, Process Safety Officer or arrange for testing via your local safety officer.

The 'Cub' VOC detector

Radiation Protection Training ..... Anytime, any place

All users of ionising radiations will soon be able to complete all pre-work training online. While a full programme of training will soon be available, the first module - *Management of Radiation Protection at Imperial College* - is available now.

The integrated radiation protection training programme may be accessed via the Learning and Development Centre website. The elements of the training are described in the flow diagram below.



The programme includes training for all groups of personnel engaged in ionising radiation work at the College - Heads of Department /Academic Supervisors, users of open and closed radiation sources and Radiation Protection Supervisors (RPSs).

The curriculum is divided into discrete training modules, the elements for completion by users being determined by work area and training needs, as dictated by an individual's role. Training is therefore tailored to an individual's needs and builds progressively, without unnecessary repetition of material.

The *Management of Radiation Protection* (Module 1) provides standalone training for HoDs and Academic Supervisors as well as foundation training for all other ionising radiations users. Training for *Users of Unsealed Sources* (Module 3) will be available in early 2017 with other modules following soon after.

The training is presented in an e-learning format in most parts, but allows for the use of practical training in specialised areas, such as for Radiation Protection Supervisors.

Access Module 1 now at this link:
https://www.imperial.ac.uk/staff-development/safety-training/safety-courses-/radiation-protection/rpmodule1/

Using Personal Protective Equipment in Photography

The Provost's Board have recently endorsed a new set of guidelines for when Personal Protective Equipment (PPE) should be worn during photography. This is to ensure that when undertaking shoots in College laboratories and technical workshops, appropriate safety measures are depicted. The College's commitment to safety in the workplace should be evident in all our photographs.

The full guidance may be found on the Communications and Public Affairs web pages at the following link: http://www.imperial.ac.uk/communications/web/photography/personal-protective-equipment/ and the information below is a condensed summary taken from those pages:

- Every laboratory and technical workshop at the College undergoes a workplace risk assessment, which determines the PPE required in that environment.
- Photographers should ensure that all people photographed in laboratory settings are using the PPE that is required for that setting.
- Photographers themselves should also ensure that they are wearing the PPE appropriate to the setting.
- All laboratory coats should be worn buttoned up.
- If laboratory coats are worn, long hair should be worn tied back, lanyards should be tucked into clothing or laboratory coats and hoods on clothing should be tucked underneath the coat.
- Closed-toe shoes should be worn.
- If a photograph depicts a group of people, all individuals should be abiding by the PPE requirements specified in the laboratory workplace risk assessment.
- Visitors are welcome. In general, the PPE requirements detailed in the laboratory workplace risk assessment should apply to all visitors.
- For portraits, in which the researcher is standing away from the workstation and the laboratory is used as a 'backdrop', the PPE requirements of the laboratory may be relaxed if it is safe to do so.
- All research 'in action' photographs should depict researchers using the PPE that is required under the laboratory workplace risk assessment.

Can I mix different waste chemicals in the same container?

We have received a number of enquiries of this nature recently.

The College generates large quantities of hazardous chemical waste, much of it consisting of organic solvents. There is a temptation to mix different chemical wastes to reduce the number of waste bottles and the space that they occupy. However, there is a danger that mixing incompatible chemicals may give rise to an undesirable event such as ignition, heat generation, violent polymerisation, explosion or evolution of flammable or toxic gases. If this happens, you have a problem. There has been the occasional incident in the College where a building or part of a building has had to be evacuated and the emergency services called because of incompatible waste chemicals reacting when mixed.

The answer to the above question can therefore only be a very cautious 'yes' - but only if you know what you are doing. Because of the potential consequences, we do not usually advocate wholesale mixing of waste chemicals (unless of course, the original mixture for an experiment was part of a recognised protocol). Difficulties include:

- Once an adverse reaction is under way, it is virtually impossible to get under control - there is often little that can be done other than evacuate. If a reaction is instant and violent, you may not even have an opportunity to do that.
- Waste can inadvertently be deposited into the 'wrong' container.
- Container labels may become damaged and illegible, particularly if left for a long time.
- If waste is collected in larger containers such as drums, it encourages stockpiling within labs, thus increasing the inventory of hazardous chemicals within a building.

IF IN DOUBT, DON'T MIX!

Contact your local Safety Officer or the Safety Department for specific advice

Safety Training

Learning Development Centre (LDC) Safety Training reported to the Health and Safety Consultative Committee on 5 October 2016. The LDC follows Universities Safety and Health Association (USHA) guidance when developing safety training programmes and applies the *Plan, Do, Check, Act/Review* model.

During the academic year 2015-2016 a total of 6977 delegates, comprising staff, postgraduates, contractor partners and external organisations, accessed the LDC classroom and e-learning safety training programmes. This means 4624 accessed through e-learning complimented by 2353 classroom attendance. This represents a huge effort on the part of the LDC in ensuring that the provision is resilient, flexible and responsive.

The 2015-16 record shows a 2:1 ratio in favour of e-learning over classroom sessions and reflects the emphasis on direct access to foundation courses from LDC Safety Training website. Staff, students and non-employees can access this resource efficiently without needing ICIS login details. The next step for e-learning is Radiation Protection where Module 1 Management of Radiation Protection is now complete with further modules on Sealed and Unsealed sources and X-Ray planned to create an integrated approach (see article on page 6).

Course Title	e-learning participants
Month One Safety Training (MOST)	1551
Risk Assessment Foundation Training (RAFT)	1362
Fire Safety and Awareness	1146
Introduction to Laser Safety	565

The total spend 2015-16 for all events was £173K with main expenditures listed below.

Offering	Catering	Venue	Trainer	Total
First Aid	£3653	£1744	£41560	£46957
Biosafety Practitioner	£925	£220	£8500	£9645
Gas Safety	£877	£2000	£29400	£48315
Pressure Fittings	£514	0	£27600	£28114

The LDC is beginning to work with Health and Safety Training Implementation Committee but there are some immediate issues which the LDC will look to for support in the future.

- Defining the responsibilities and ownership for central and local provision.
- Enabling effective consultation and communication to work in a planned and managed way.
- Ensuring Faculties and Departments plan ahead and cascade information to user groups to access the core programme.
- Securing suitable accessible venues for LDC that are cost effective.

Contact Details

Occupational Health Service
Level 4
Sherfield Building
South Kensington
London SW7 2AZ

Telephone:
020 7594 9401
E-mail:
occhealth@imperial.ac.uk
Website:
www3.imperial.ac.uk/occhealth

Safety Department
Level 4
Sherfield Building
South Kensington
London SW7 2AZ

Telephone:
020 7594 9423
E-mail:
safetydept@imperial.ac.uk
Website:
www3.imperial.ac.uk/safety

If you have any comments or suggestions for inclusion in the Newsletter, please contact the editor:

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