

**University of St Andrews  
School of Chemistry**

**Minutes of the School Safety Committee  
Tuesday 20<sup>th</sup> February 2024**

Kevin Jones	[KJ]	H&S Manager (Chair)
Magnus Alphey	[MA]	BSCR, X-ray
Terry Smith	[TM]	Director of BSRC
Iona Hutchison	[IH]	Disability Officer/School Coordinator
David Brown	[DB]	Drochaid
Petr Kilian	[PK]	Assistant Safety Coordinator
Paul Connor	[PAC]	Phys Chem Representative
Brian Walker	[BW]	Senior Electronics Technician
Varrie Ogilvie	[VO]	H&S Assistant
Bela Bode	[BEB]	Assistant Safety Coordinator
Andreas Stasch	[AS]	Assistant Safety Coordinator
Scott Filipovic	[SF]	Building Services Manager

### **1. Apologies**

Apologies received from Iain Smellie, Robert Steele, Dominic Stewart and Nick Taylor. AS to leave early due to teaching commitments.

### **2. Welcome to New Members**

KJ welcomed VO who has recently started as the H&S Assistant for the School of Chemistry. VO's current role involves assessing dangerous goods packages, enrolling new starts on to the EssentialSkillz platform and will shortly begin delivering in-person inductions.

KJ explained that Dominic Stuart will join future meetings as a member of the committee. Dominic works as a teaching laboratory technician and has a good understanding of H&S. Iain Smellie is a member of the safety committee, but has teaching responsibilities and is often unavailable during the semester. Dominic can provide an insight H&S issues relating to undergraduate students.

### **3. Minutes from Previous Meeting**

KJ circulated the minutes from the previous meeting beforehand to give committee members the opportunity to raise any points today. No issues were raised and were taken as read.

### **4. Matters Arising**

#### ***Lab Hazards Document:***

KJ is in the process of updating the "laboratory hazard" document with the ultimate aim to make the information accessible on the chemistry intranet. As part of an updated "laboratory safety self-assessment form" (to be released shortly), staff can update the document as required.

KJ also pointed out that academic groups can simply email to inform of any changes. KJ & VO have completed two floors and expect to make the final document available in early March. MA reminded the committee that the "laboratory hazard" document is a schematic of the layout of each laboratory

in the Purdie Building chiefly for use by the Emergency Services in the event of a major incident. In the documents, hazardous items such as solvent storage compressed gas cylinders are highlighted as well as fire-fighting equipment. KJ highlighted that changes to laboratories happen infrequently and that most remain static in terms of key hazards so this should not represent any significant increase in workload for the monthly self-inspections.

#### ***Overnight Forms:***

KJ provide an update on the status of “overnight forms” (new laminated form including experimental details, boxes indicating associated hazards and steps to be taken in an emergency). A large number of overnight forms are required and KJ is in the process of printing and laminating them.

KJ passed round the table an example of the overnight form and proposed that we adopt this version in the first instance. KJ went on to say that if bespoke forms are required these can be produced in discussion with specific laboratories. TS asked for confirmation on whether the forms must be displayed on the fume hood as well as outside the laboratory entrance. KJ confirmed there is a requirement for both; that the overnight form must be displayed on both the fume hood and in the wall-mounted document holder along with a copy of the full risk assessment.

#### ***Guidance Documents:***

KJ discussed “Guidance documents” based on incidents discussed in the last committee meeting. A one-page summary titled "Safe Use of Heat Guns" has been produced following the incident in which a heat gun was dry a solvent-soaked cardboard box that resulted in a small fire.

Similarly, a document titled " Reaction Scale-Up: Safety Considerations" was produced following an incident in which a reaction was scaled leading to a reaction vessel failing.

The document advocates a step-wise approach to reaction scale up (e.g. incremental increase in the amount of starting material used in the reaction) and highlights key questions that should be considered before performing a reaction on an increased scale.

There was a round-table discussion on the questions researchers must ask themselves before starting an experiment on an increased scale. Following the discussion, KJ explained that it was difficult to capture all information within a single document, but the important thing is to get students to consider these issues before starting such reactions. PAC agreed that it is important to encourage people to think about scale. VO asked whether the “guide to scale” document will be available on the CHARM system. KJ confirmed that it is not currently available but he can contact IT services to see how easy it would be to include a link to the document within the CHARM system. KJ explained he would circulate a copy of the document to the H&S committee and upload the current version on the H&S website. If changes are required then an updated version can be uploaded.

#### ***Updates to CHARM System / Health Surveillance / Gas Cylinder Training:***

KJ pointed out that discussions regarding possible replacement / updates to the CHARM system are ongoing. MA pointed out that this may be 1-2 years away. KJ confirmed that we have been informed by EHSS that there will be ample opportunity to provide input before any decisions are made.

Previous requests for health surveillance from Occupation Health are still in discussion. KJ will report back to the committee when further progress is made.

EHSS raised the idea of gas cylinder training before Christmas, however, KJ and MA have not heard anything of regarding further details. KJ will contact John Nicholson and report back to the committee.

Actions	Date Completed
KJ and VO to update "lab hazards" document. VO to separate into individual files and add to intranet. Once complete, AS and KJ to circulate the updated monthly checklist to staff.	
KJ to print, laminate and distribute overnight forms	
KJ to circulate guidance documents to H&S committee and upload current versions to H&S website	
KJ to liaise with EHSS regarding health surveillance and gas cylinder training	

## 5. Review of Accidents

### ***Incident 1 – Incident in which a handful of undergraduate students have been exposed to HCl vapour.***

The experiment in question involves a reaction between phosphorous trichloride (PCl<sub>3</sub>) and methanol (HCl has generated as a by-product). After a set time, students "sparge" their reaction flask (bubble nitrogen gas through the solution) to displace HCl. After this step, the reaction flask is placed on a rotary evaporator (on the laboratory bench) to remove the reaction solvent. It appears that some students have not suitably sparged their flask resulting in HCl vapour being released. This has resulted in a handful of students reporting irritation to the nose and throat. KJ highlighted that a concern was that some students only reported the incident the day after the exposure despite feeling unwell in the teaching laboratory.

This experiment has been used in the teaching laboratories for many years (>14 years) with no previous issues. KJ pointed out that it appears no changes have been made to how the experiment is performed and the information provided to the students has not changed.

Following the report of the incident, Brian Chalmers (laboratory convenor) made a video demonstrating the sparging step (demonstrating both the correct and incorrect flow). The video was displayed in the laboratory during teaching and it has also been uploaded to Moodle for the students to watch before carrying out the experiment.

AS asked at what point in the experiment does the potential exposure take place. KJ explained that he believes it is happening during the evaporation step.

PK asked whether the rotary evaporator sits on the bench and vents into the open air. It was confirmed that this was the case, that the pump is under the sink and that the reaction is not vented into a fume hood i.e. HCl vapour could go into the air (i.e. the HCl vapour will not condense and will be free to leak out in contrast to volatile solvents). KJ pointed out that the incident occurred when a student was washing up their glassware and were not performing that particular reaction at the time of the incident.

TS suggested a solution might be to put the final part of the reaction under vacuum, then sparge the solution. AS expanded and explained that during the experiment, approximately 50 ml of DCM is boiled off and by bubbling this through nitrogen gas the volume of DCM is reduced. There was a consensus that there has always been a degree of HCl vapour escaping into the open air of the

laboratory. It is also possible that in many instances the student has noticed the sparging had been ineffective and stopped the reaction before any venting could take place.

PK suggested that a rotary evaporator be placed in the fume hood and used exclusively for this reaction. PK explained that there is a rotary positioned within a fume cupboard that is now available. PK suggested that by using a rotary in the fume hood any HCl vapour produced would be vented there instead. AS pointed out a potential bottleneck with the rotary in the fume hood as students would need access to the rotary at the same time. However, the rotary step takes only ~10 mins and if they are shown how to use the equipment properly the total time might be acceptable. They could use the rotary in the fume hood in groups of 6-8 at a time to avoid a bottleneck. PAC also suggested that you could set up a vent from the existing vacuum pump that is long enough to reach the fume hood

MA suggested a Dressler bottle to soak up HCl exhaust.

KJ suggested adding a base wash at the end of the reaction. TS highlighted that a base might cause frothing and be unsuitable. VO asked whether the RA/SOP will need to be updated once a decision is made. KJ has submitted an accident report and highlighted that troubleshooting will take place before the RA is updated.

KJ will highlight the various solutions offered by H&S committee and look to implement a solution in partnership with Brian Chalmers and laboratory technicians.

Actions	Date Completed
KJ to raise point of undergraduates reporting incidents in the teaching laboratory at staff council on Monday 26 <sup>th</sup> February.	
KJ to discuss potential solutions with Brian Chalmers and Technicians and implement changes to experiment.	

### ***Incident 2 – Bump to Head During Movement of Gas Cylinder***

A postdoc was showing a PhD student how to transport a compressed gas cylinder via the lift without travelling with the cylinder.

The postdoc asked the PhD student to go to the destination floor to hold the lift when it arrived. The intention was for the postdoc to remove the cylinder from the lift, however, the PhD student thought they were to remove the cylinder and, whilst tilting the cylinder to a 45° position, they bumped their head on the top of the cylinder. KJ pointed out that on this occasion the contractor, Pert Bruce, had put a piece of wood on the floor hence the postdoc decided to stand the cylinder up vertically rather than at a normal 45° angle. VO highlighted how heavy these cylinders are.

MA mentioned that, in the Bute building, the lifts have chains to secure cylinders to the wall while in transit. However, there are several manoeuvres involved with this system (move the cylinder, chain it to the lift, operate the lift, unchain it and move it back on to the trolley for transportation) which has potentially a greater risk of accident associated with it than our current system.

PAC pointed out that some cylinders are too tall for the trolleys. BW asked if this is a one-off incident. KJ was not aware of this happening before, but is encouraged that students feel comfortable in reporting such incidents. VO agreed that it is good students are reporting incidents. KJ pointed out that there are other kinds of trolleys more suitable for transporting tall cylinders and Chris Baddeley

has approved the purchasing of two or three new trolleys. VO suggested we do a trial run to test the transportation of cylinders.

PK asked if the cylinder was of a standard size. PAC confirmed that nitrogen and argon 300 bar gas cylinders are tallest and have a different balance point which could be taken into consideration for training. There was also a discussion about signs when a lift is being used to transport compressed gas cylinders.

MA suggested solutions such as arranging demonstrations and training opportunities through Gas Safe who offer training at a cost of approximately £100 per person. KJ suggested that we could identify high cylinder users and arrange training sessions for groups of users who then carry out in-house training.

BW raised the issue of safety shoes e.g. shoes with steel toe caps. KJ agreed that we should provide these. KJ summarised that there are ongoing issues here, and we could look to other institutions such as Edinburgh University and Heriot Watt University who use overshoes & share safety boots.

PAC confirmed that he knows of other places where they share safety shoes. MA offered an alternative where a designated trained person e.g. from stores can deliver a cylinder to a laboratory. BB pointed out that this could be a problem at the weekend when stores is closed. PAC stated that cylinders weigh 60 Kg and suggested that the designated person is of a certain stature but acknowledged there may be issues of equality here.

Actions	Date Completed
KJ to liaise with EHSS regarding gas cylinder training	

### ***Incident 3 – Chemical Spillage***

In December 2023, there was a chemical spillage while a student was transporting a chemical to an adjacent laboratory. The student was carrying multiple reagent bottles and dropped one of them. MA highlighted that he has also witnessed people carrying 2L flasks by the neck or multiple bottles being carried with no holder in the BMS / BSRC buildings.

KJ pointed out that he has recently purchased metal canisters that he will make available through stores to assist in carrying Winchesters / reagent bottles, but can look to purchase carriers for individual laboratories if this would prevent future spillages. PAC suggested that each laboratory should have one. PAC also highlighted that several institutions will not release material from stores unless they have an appropriate carrier.

KJ emphasised that, generally, researchers use trolleys to transport bottles from stores. If there is a single item KJ will ask Artur to provide a carrier and ask that the carrier is returned after use.

KJ will update the on-line Chemistry Induction course to include a discussion of movement of chemicals / reagents. KJ and VO will also include a discussion of movement of chemicals in the in-person induction. KJ will also highlight movement of chemicals in the safety workshop he delivers to new staff / students in September.

Actions	Date Completed
KJ to provide carriers to stores	

#### **Incident 4 – Needle Stick Injury**

KJ outlined a recent needle stick injury in which an undergraduate (final-year project student) was resheathing a needle. The student had been informed in the safety induction delivered by KJ that needles were not be resheathed, but the student had no recollection of this.

This led to a discussion of how best to tackle this issue. BEB recommended being more explicit about how to handle needles. VO suggested that we need a demo of the right thing to do. KJ there is already a demo on the website, but agreed that this should be emphasised. BW commented that there will always be an element of human error and it is difficult to eliminate such incidents. BEB suggested that the person is asked to repeat the EssentialSkillz H&S training courses again as a well of ensuring compliance. PAC suggested a standalone course covering safe needle use that anyone receiving a needle stick injury due to resheathing would be asked to complete.

KJ thought this idea would be worth exploring and will look to create such a course.

Actions	Date Completed
KJ to produce short course for those involved in needle stick injuries when resheathing a needle.	

#### **6. Update on EssentialSkillz Courses, In-person Induction and H&S Handbook**

KJ provided an update on the In-person induction, EssentialSkillz courses and H&S Handbook.

There are two mandatory courses (An Introduction to Fire Safety in Laboratory-based Science and Safe Working in the Laboratory) that the University requires all staff / students to complete.

KJ and MA compiled three further courses on EssentialSkillz (Risk Assessments for Science Schools, A User Guide to the CHARM system, and Chemistry Induction). These are tailored to the School of Chemistry and provides specific information about the Purdie building.

VO has been enrolling new staff and students onto the EssentialSkillz platform.

BW asked whether everyone is included i.e. Drochaid staff. KJ confirmed that Drochaid are not currently included. KJ will determine whether this H&S course would be useful to Drochaid.

BEB asked whether enrolment onto EssentialSkillz includes staff, postgraduate researchers, postdocs etc and KJ confirmed that it is for all staff, students and visiting scholars. Carolyn Busby, VO and KJ are tracking enrolment and completion of the courses with the aim of capturing everyone.

VO and KJ have compiled an in-person induction checklist for new starts. KJ passed round a few copies of the induction checklist. The idea is for VO (and KJ if VO not available) to give a walk-around tour of the Purdie Building.

With people joining the department on a regular basis, the plan is for VO to do the induction every two weeks. This way we can capture several people at a time, but sometimes it will be an individual who receives the tour rather than a group of students / staff.

PAC asked whether laboratory technicians could be given a copy of the checklist in case new starts would like to do part of the induction again. MA highlighted that in the BSRC they try to focus their induction on the safety aspects in medicine, but there is scope for you to add other elements and

make it a wider induction e.g. point out who they can contact regarding building issues - contact Scott, IT issues -contact Fraser etc.

KJ is in the process of updating the H&S Handbook. The idea is to move information required by all building users to the front of the handbook and include details on specific chemicals / operations in later sections. The intention is not to remove any content as this is very thorough, but hopefully just make it as easy to navigate as possible.

KJ aims to finish making changes to the handbook by early March and will circulate to the committee for comment in due course.

Actions	Date Completed
VO to start in-person inductions for all new starts	
KJ to update H&S handbook and circulate to H&S committee for comment	

### 7. Training for Fire Wardens - Fire Alarm Response

KJ reminded the committee of the previous discussions regarding the fire service having to be informed of a confirmed fire before they are called out.

KJ attended practical training on how to investigate the cause of the fire alarm (same training provided to S&R). KJ asked for volunteers from the committee to undertake the same training (likely to be in April 2024) such that Chemistry can investigate alarm activations before S&R arrive. SF and PAC volunteered. KJ explained that he would also ask AS if he would be willing to attend this training.

KJ highlighted that the S&R Team Leader has the ultimate say on whether they are happy for the fire alarm panel to be reset, but providing support might mean our response can be quicker regardless of whether the fire is real or a false alarm.

BW raised the point about refuge training and the panel, Evac chairs for those with a disability and whether a new defibrillator is needed as the AED is 15 years old. KJ will review all of the points above and but highlighted that the defibrillator has recently been tested and is still functional. BW mentioned that the batteries for the defibrillator need to be replaced every five years.

Actions	Date Completed
KJ to contact Neil Johnston about second training session and approach AS about attending	
SF, PAC and AS (if able) to attend training	

## 8. Landline Telephones

KJ explained the decision by IT services to remove landlines from the department and switch to Teams Telephony. KJ highlighted that it was unfortunate that the health & safety implications of switching was not discussed with individual departments before the switchover was rolled out.

KJ pointed out that we have retained four emergency landlines located on each floor in the corridor to the left-hand-side of the lift. VO highlighted that she is currently unable to make any outside calls on Teams as there is no keypad when she clicks on the "calls" button. VO contacted Teams support and was advised it would be sorted asap but, so far, the issue has not been resolved. Teams support suggested it had to do with VO being a new member of staff and not having a landline previously.

DB informed the committee that Drochaid have retained their landline telephones as they have an individual contract with BT. KJ indicated that a consequence of the switch over is to rely on people using their personal mobile devices to make outside calls, but is glad a handful of emergency landlines have been retained.

IH mentioned that before Teams you had to have special privileges to make a call abroad.

## 9. A. O. B.

### *Safety Issues with Electrical Items*

BW showed the committee a box of cables / plugs he had collected from within the building that do not meet UK safety standards. Some plugs have a removable cover and pose a risk of electrocution if the switch on the socket is not turned off leaving you exposed to a live wire.

Many of the poor quality plugs had been imported or brought in by staff and students from China or the US, which have different safety standards (e.g. did not have a in-built fuse or the voltages were incompatible).

It had previously been suggested that Chemistry holds an "amnesty day" to allow people who missed the last PAT testing period to bring their portable appliances for estates to check and PAT test.

MA asked BW whether a two-pin plug can be cut off and replaced. BW confirmed that this is possible in some instances.

BW and VO are putting together a montage of photos of compatible and incompatible cables and plugs etc. for portable appliances for reference.

PAC pointed out that since Brexit the UK prefers a "UKCA" mark and not the "CE" mark, which is European. Confusingly, there are similar marks in different fonts that mimic UKCA. BEB suggested a list of the kinds of portable appliances to be checked i.e. individual phones, laptops, charges and cables.

<b>Actions</b>	<b>Date Completed</b>
BW and VO to produce electrical safety document	
KJ to contact Estates about regular testing	
VO to add discussion of electrical items to in-person induction	



### ***Decontamination Certificates***

BW raised the issue of decontamination of equipment before it comes into the workshop.

MA stated that any piece of laboratory equipment should have been cleaned before it is taken to the workshop for repair.

TS mentioned that, in industry, you are required to sign a certificate to say you have cleaned the equipment.

BEB suggested that decontamination of equipment and compatibility of various personal devices form part of the in-person induction. VO agreed and understood that these pose a potential health and fire hazard, respectively.

BW explained that PAT testing takes place annually over a four-week period (normally at the end of the year) and can be quite disruptive. BW recommended that PAT is performed on any equipment brought into the building. MA shared the example of Mac MacArdle in the BSRC who has relocated from Dundee and has brought his own equipment with him.

<b>Actions</b>	<b>Date Completed</b>
KJ to discuss with Armando Lacerda about decontamination certificates	