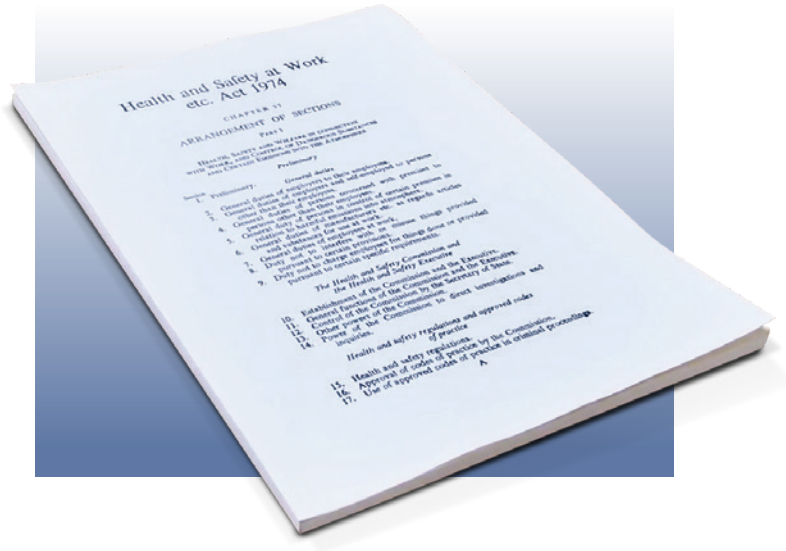
OCTOBER 2023

Bulletin 279 Health & Safety

The Health and Safety at Work etc. Act 1974

Given that the health and safety advice from SSERC is underpinned by various pieces of legislation, we thought it might be an idea to let you know a little about the Acts and Regulations that affect schools and colleges.

It is worth saying at the outset that health and safety is not a devolved matter: all health and safety laws are set in Westminster.



We'll start at the beginning. There is in fact only one Act directly relating to health and safety, The Health and Safety at Work etc. Act 1974 (HSWA). An Act is what is known as primary legislation: a motion is tabled in Parliament, debated and voted on just like most other pieces of legislation we are familiar with.

What is the HSWA?

HSWA is a key piece of legislation covering all aspects of health, safety and welfare in the workplace. It is an 'enabling' act – which means that it allows various health and safety regulation (such as COSHH and The Electricity at Work Regulations) to be introduced without any need for the normal parliamentary process – which can be very time-consuming. (Parliament can, though, block any proposed regulations).

At work

This is a key point. There is no need to risk assess your garage before carrying out any work on your car (though strangely HSWA itself does not insist on risk assessment). But similar work in a college workshop would need to be risk assessed. Most of the time it is clear what being 'at work' means but travel can be confusing. If you are travelling for work, on a trip, collecting equipment, moving between premises on a split site, then that is considered as being at work. But travelling to work from your home and back does not.

The key points of the act are:

Duties of employers

Most duties are placed on employers: Local Authorities for most schools but Boards of Governors in most colleges or independent schools. They must:

- ensure, so far as is reasonably practicable the health, safety and welfare at work of all his employees (a similar duty applies towards others who are not employees e.g. learners);
- make sure your workplace and equipment is safe and without risks to the health of workers and anyone else;
- produce, and make available, a health and safety policy;
- explain how risks will be controlled and tell you who is responsible for this in a way you can understand;

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Other topics

- consult and work with you and your health and safety representatives (if there are any) in protecting everyone from harm in the workplace;
- give you the health and safety training you need to do your job free of charge;
- provide any equipment and protective clothing needed for the job and ensure it is properly looked after free of charge;
- provide adequate facilities for welfare eg toilets, washing facilities and drinking water.

Duties of employees

Employees do not get off scot free here. Duties are placed on you as well. You must:

- look after your own health and safety as well as that of others;
- follow the training you have received when using any work items your employer has given you;
- take reasonable care of your own and other people's health and safety;
- co-operate with your employer on health and safety;
- tell someone (your employer, supervisor, or health and safety representative) if you think the work or inadequate precautions are putting anyone's health and safety at serious risk.

This phrase *so far as is reasonably practicable* (SFAIRP) is widely encountered in health and safety law. It means that the risk in a particular situation can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk.

This is, in the end, a judgement. Guidance is available from the HSE but ultimately the decision about whether a measure is practicable is for the courts.

E.g. providing a rubberized surface over a whole playground at the cost of £1,000,000 to prevent grazed knees is clearly not reasonably practicable.

Providing suitable ear defenders for workers in a noisy workshop, clearly is.

One of the most important aspects of the Act is that it allows all sorts of other health and safety law to be passed in the form of secondary legislation which, to all intents and purposes, by-passes Parliament. We will look at the most important of these regulations in future Bulletins. <<

HSE radiation inspections

In Bulletin 276 [1] last summer, we reported that the Health and Safety Executive (HSE) intended to inspect a sample of schools throughout the UK to check whether their use and storage of radioactive materials complied with the Ionising Radiation Regulations (IRR17). In the period November 2022 to March 2023, 16 Scottish schools were visited.

A source undergoing a leak test.

The SSERC team had a number of meetings with HSE personnel before and after the inspections. The following is a summary of what they found out, what is happening now and what happens next.

Findings

Compliance rates – the percentage of schools where no breaches were found - were quite high when compared with other sectors. There were, however, issues in some schools, resulting in employers being both fined and required to produce a plan detailing how they would deal with shortcomings. Schools that were following SSERC guidance were compliant. According to one inspector, the situation in Scotland was “all or nothing”. Schools were either exemplary or were doing virtually none of the tasks – stock checks, leak tests etc. that are required by law. Interestingly, all of the non-compliant schools were aware of SSERC advice and knew that they could contact us for help. It appears that the greatest cause of non-compliance was that when a member of staff who had been responsible for supervising work with radioactive materials moved on, nobody else picked up the mantle. Out of date training was also a significant issue. We must say that at no point did we feel that inspectors were failing schools for petty nit-picks. Indeed, any feedback we received about the inspection process was positive. Words like “supportive” and even “kind” were used.

What is happening now?

We will be modifying some of our guidance as a result of the inspections.

- When carrying out a stock check, please list, on the log of usage, the individual sources that were checked.
- HSE expect all those using radioactive materials to be trained every 3 to 5 years. Whilst this could be inhouse, the member of staff responsible for overseeing work with these materials, called the RPS by many schools, should have SSERC training at this frequency too. This could be via one of our online courses, but if the RPS has never had direct training on safe handling using actual sources, they should attend a face-to-face training event. If employers wish to run their own safe handling training this must be sanctioned by SSERC.
- Though not a modification to our guidance, we would like to again stress that any risk assessments or contingency plans supplied by SSERC must be modified to suit local circumstances.

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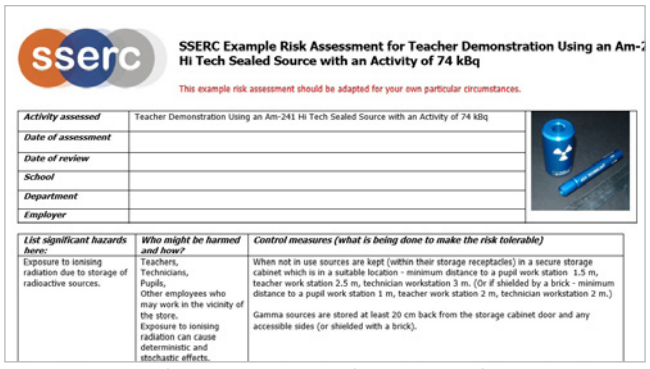

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SSERC Example Risk Assessment for Teacher Demonstration Using an Am-2 Hi Tech Sealed Source with an Activity of 74 kBq

This example risk assessment should be adapted for your own particular circumstances.

Activity assessed	Teacher Demonstration Using an Am-241 Hi Tech Sealed Source with an Activity of 74 kBq
Date of assessment	
Date of review	
School	
Department	
Employer	

List significant hazards here:	*Who might be harmed and how?*	*Control measures (what is being done to make the risk tolerable)*
Exposure to ionising radiation due to storage of radioactive sources.	Teachers, Technicians, Pupils, Other employees who may work in the vicinity of the store. Exposure to ionising radiation can cause deterministic and stochastic effects.	When not in use sources are kept (within their storage receptacles) in a secure storage cabinet which is in a suitable location - minimum distance to a pupil work station 1.5 m, teacher work station 2.5 m, technician workstation 3 m. (Or if shielded by a brick - minimum distance to a pupil work station 1 m, teacher work station 2 m, technician workstation 2 m.) Gamma sources are stored at least 20 cm back from the storage cabinet door and any accessible sides (or shielded with a brick).

Generic SSERC risk assessments must be customised.

SSERC produces guidance and helps school staff implement it via our training and help-lines, but it is the employer's duty to see that our advice is being followed. Several local authority personnel have been in touch with us for advice on making non-compliant schools compliant. We have also had enquiries on how to carry out inhouse inspections and have supplied checklists linked to our own documentation. These employer-led inspections have highlighted some additional issues.

- The only radioactive materials you should have in school are the ones detailed in Bulletin 256 [2]. Some schools are finding uranium and thorium compounds, usually in small amounts. Unfortunately, even small quantities can be tricky to dispose of, but you do not have an option to keep them.
- You are allowed to keep an ionisation chamber smoke alarm to demonstrate that it contains a radioactive source. On no account should the device be dismantled. To do so without a permit from SEPA, the environmental agency, would be a breach of law. If you have a dismantled smoke alarm that you cannot put back together, disposal can be difficult as it is subject not only to radiation laws but to waste electrical equipment legislation. "Difficult" is, fortunately, not the same as "impossible". Again, keeping a dismantled smoke alarm is not an option.
- Another item you must dispose of is a protactinium generator that is 8 years old or more. Disposal is expensive, but if an aged generator leaks and contaminates the fabric of a school building, failing to dispose will prove to be the falsest of false economies.

  So far, no employer inspection has discovered any aged protactinium generators, but we believe there are a very small number of them "out there".

We have every sympathy for staff who discover sources that should not be in schools. In almost every case, it is an inherited problem. If you discover a source that is not on our approved list, please get in touch. Remember that you should not buy or acquire any radioactive materials or artefacts without consulting SSERC.

What happens next?

HSE will continue to inspect schools. If you get notification of an inspection, please let us know and we will work with you to help you ensure that everything is in order. Note that, even if you have no sources but have possessed some in the last two years, in theory HSE could still inspect your records which you must retain for that period. HSE have also been asking about radon in schools. Whilst that is not the responsibility of teaching and technician staff, we have some basic guidance available on request. It might be worth highlighting this to your senior management, particularly if you are not in a local authority school.

It is our view that, in Scotland, the inspections have had a largely positive effect, raising awareness of the need to comply with legislation and emphasising SSERC's role in helping you to do so. <<

References

[1] https://www.sserc.org.uk/wp-content/uploads/2022/06/Bulletin-276p18-Radioactivity-inspections.pdf
[2] https://www.sserc.org.uk/wp-content/uploads/2020/08/256-Auditing-Radioactive-Sources.pdf

Quick disposable dust mask guidance

The purpose of disposable dusk masks is to provide a means of controlling airborne containments in the air that could be inhaled by an individual. Under COSHH regulations, employers are required to provide employees with suitable personal protective equipment where necessary. This is in addition to other control measures such as dust extraction systems found within the technology department.

Any dust mask or other form of respiratory protection should limit the exposure to contamination (i.e. wood dusts) to a level that is as low as reasonably practicable and below the workplace exposure limit set for the type of substance. For example, the WEL hardwood dust is 3mg/m3 and 5mg/m3 for softwood. Both being based on an 8-hour time-weighted average.

So what types are available and what should be used?

Not suitable for technology departments

Nuisance dust masks

A nuisance dust mask (Figure 1), is a type of disposable mask that provides basic protection against larger non-toxic particles in the air. These masks are designed to be lightweight, comfortable, and affordable, making them suitable for tasks where the primary concern is general dust and particulate matter rather than hazardous or toxic substances. Nuisance dust masks are only suitable for environments where the particles present are not toxic or harmful to health.

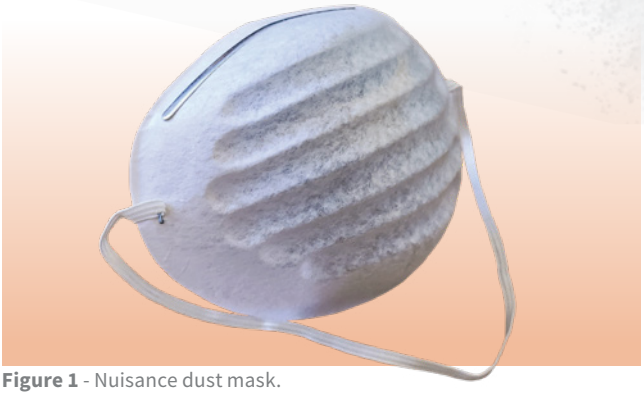

Figure 1 - Nuisance dust mask.

FFP1 & FFP2

An FFP1 or FFP 2 mask (Figures 2 and 3), is a type of disposable face mask that provides minimal protection against non-toxic particles. FFP stands for "Filtering Face piece Particle" and the number proceeding it indicates the level of filtration efficiency. FFP1 masks are the lowest level of respiratory protection among the FFP masks.

FFP1 masks are designed to filter out at least 80% of airborne particles with a size of 0.3 microns or larger. They provide basic protection against larger dust particles, pollen, and other non-toxic particulate matter.

FFP2 masks are designed to filter out at least 94% of airborne particles with a size of 0.3 microns or larger. They provide better protection against fine dust particles, aerosols, and certain types of hazardous particles.

While FFP1 and FFP2 masks offer some level of protection, they do not provide a tight facial seal like more advanced respirators. As such, they may not be effective in situations where a secure seal is required to prevent particle leakage around the edges of the mask. FFP1 and FFP2 masks are typically disposable and designed for single-use applications. They are not meant to be reused and should be discarded after use.

Suitable for technology departments

FFP3

FFP3 masks (Figure 4) are designed to offer maximum protection against airborne particles, including fine dust, aerosols, and hazardous substances. They are designed to filter out at least 99% of airborne particles with a size of 0.3 microns or larger. They offer excellent protection >>

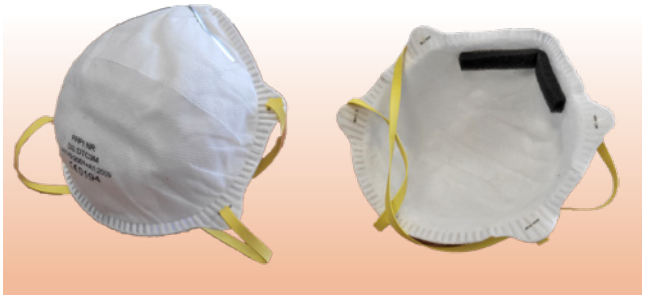

Figure 2 - FFP1 mask.

Figure 3 - FFP2 mask.

Figure 4 - FFP3 mask.

against fine particles, including those that could be harmful to health. They are suitable for environments where the particles present are highly hazardous and can pose significant health risks.

FFP3 masks provide a better and more secure facial seal compared to lower-level FFP masks. A proper fit and seal are critical to preventing particle leakage around the edges of the mask.

Face fit testing should be performed to ensure that the mask properly fits the wearer's face and minimises the risk of airborne contaminants leaking in around the edges of the mask and therefore reducing its performance and putting the user at risk.

These masks are typically disposable and intended for single-use applications. They should be discarded after use to ensure consistent protection.

When using FFP3 masks, it's crucial to ensure that they are certified by reputable standards organisations to ensure their effectiveness (such as CE or BSI markings). Proper use, fit, and disposal are essential for maximising the protection provided by FFP3 masks. Keep in mind that while FFP3 masks offer a high level of protection, they are not a substitute for other safety measures, and other personal protective equipment (PPE) may be necessary depending on the specific hazards present.

Half-mask/full-face respirator

Both half-mask and full-face respirators (Figure 5) are types of respiratory protective equipment designed to provide different levels of coverage and protection for the wearer's face and respiratory system.

Figure 5 - Half-mask and full-face respirators.

A half-mask respirator covers the lower half of the wearer's face, including the nose and mouth. Whereas a full face respirator covers the entire face, including the eyes, nose, and mouth.

They both typically use a filter cartridge or canister to provide protection against specific types of hazards, such as particulates, gases, or vapors. In the case of wood dusts, FFP3 filter cartridge can be fitted.

Half-mask respirators are often lightweight and more comfortable for extended wear compared to the traditional disposable masks.

The choice between a half-mask and a full-face respirator depends on the specific hazards present in the environment, as well as the comfort and protection needs of the wearer. It's important to follow manufacturer guidelines, undergo proper fit testing, and receive training on how to properly use and maintain the chosen respirator.

Powered visor respirator

A powered visor respirator (Figure 6), also known as a powered air purifying respirator (PAPR) with a visor, is designed to provide respiratory and eye protection. It consists of a clear visor or face shield that covers the eyes, nose, and mouth, combined with a powered air purification system that supplies filtered air to the user. The main part of the respirator is reusable and therefore can reduce costs over time as only the filter would need replacing. They are generally more comfortable to wear for extended periods compared to traditional tight-fitting respirators.

Figure 6 - Powered visor respirator.

These types of respirators are generally more protective than non-powered half mask respirators as a fan pushes clean filtered air down the wearers faces, creating in effect a positive pressure inside the face piece under most work conditions, which reduces inward leakage of potentially contaminated air.it should be noted that the correct type of filter should be selected and fitted to suit the contaminant being filtered.

Wash and glow - visualising the spread of bacteria

SSERC received an enquiry recently about a practical activity designed to simulate the spread of bacteria. Learners spread a commercially available "lotion", containing microscopic particles that fluoresce when exposed to UV light, over their hands and then shake hands with their peers in the classroom. During this process, lotion will be transferred between learners, simulating the spread of microbes. To determine the extent to which transfer has occurred, learners irradiate their hands with a UV light.

SSERC have produced guidance on optical radiation [1], which is pertinent to this activity. The majority of the radiation emitted from the type of lamps typically used in this activity is UVA, which poses hazards to the eyes and skin. SSERC have carried out various tests and found that the exposure limits for emissions from such lamps are unlikely to be breached in a school lab provided that:

- Users avoid looking directly at the lamp
- Users do not hold or carry the lamp with their hands or fingers across the tube when the lamp is on
- Users avoid irradiating their skin where possible.

Given the requirement for learners to irradiate their hands with UV light to visualise the lotion, the activity does not adhere to SSERC guidance. Figure 1 shows a hand-held UV light that might be used in such an activity; there are other types of UV lamp that might be used, which can have more stringent control measures.

A straight-forward, although messy, alternative to this proposed activity is to use glitter gel; learners spread a glitter gel over their hands, shake hands and then observe the transfer of glitter. This ultimately shows the same result but without the need to use UV light.

Another alternative option involves learners each starting with a test tube of water – except one learner, who has a suspension of starch (with starch representing a microbe). The "transfer of bodily fluids" involves each learner using a pipette to exchange half of their test tube contents with another learner. This can continue for 3-4 exchanges. At the end, they all test their samples using iodine to find out how far the starch/microbe spread. Inexpensive, safe, fun and still conveys the same message. <<

Figure 1 - Guidance states that individuals must not carry UV lamps with fingers across the tube.

Reference

[1] SSERC, School sources of optical radiation, available at https://www.sserc.org.uk/health-safety/physics-health-safety/optical-radiation/school-sources-of-optical-radiation/.

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