

Doing Great Science Safely

Your Introduction to Safety, Health & Environment at RAL



WELCOME TO STFC AND TO RAL

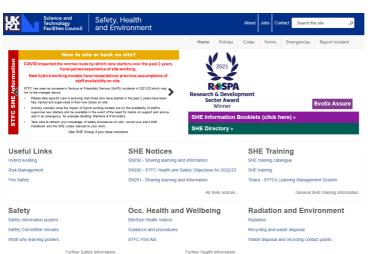
This information booklet is intended to accompany the SHE induction course and to provide a reference for use at a later date.

RAL is a very exciting place to work and we want your time with us to be enjoyable, rewarding, productive... but most of all... safe.

OTHER SOURCES OF INFORMATION



There are several sources of SHE information you will find useful during your induction and when working at STFC. The staff intranet, The Source, signposts to Human Resources, Estates, and several other Corporate Services, and importantly to the SHE website.





SECURITY

Personnel Security

Personnel security is based on knowing who people are and controlling what they have access to.

Your role is to:

- Wear your pass visibly at all times. Note, some departments will have areas where wearing a lanyard is inappropriate, such as where there is rotating machinery or Lasers. Please find an alternative method of displaying your pass in these areas.
- Challenge, or report, any person on site who is not visibly carrying their pass
- Never allow others to tailgate through security turnstiles/barriers
- Take care of your personal belongings
- Report actual or suspected security incidents to Site Security.

Non-STFC Staff

If you are hosting non-staff such as visitors, facility users, contractors on site **you are responsible** for their safety and implementation of simple security controls such as:

- · knowing who they are and what they are doing
- ensuring they wear their site passes
- reporting any suspicious behaviour to Security.

Radioactive Materials Security

The security of STFC radioactive materials, which covers sealed and open sources, is reviewed regularly by management and the Environment Agency, with guidance from the police Counter Terrorism Security Advisors, to prevent their theft or loss.

Vigilance is required by those working with, or in areas where, radioactive materials are present to ensure they are accounted for at all times and their security is not compromised. Particular attention needs to be paid to visitors or contractors admitted to such areas.

GENERAL SITE SAFETY

ALL RAL road users must adhere to the Highway Code.

Drivers

The maximum site speed limit is 20mph.

All drivers must hold a full valid driving license for the vehicle being driven. Drivers of STFC owned or hired vehicles must also hold a valid Permit to Drive.

20

The use of mobile phones or mobile communication devices, including hands free kits, is not permitted whilst driving on site, or on council business.

Vehicles must only be parked in designated areas, with a valid parking permit displayed in the windscreen. Do **not** obstruct dropped kerbs.



All vehicle-related collisions on or off site must be reported immediately to Security and an incident report must be submitted via SHE Assure.

Driving without due care and attention, speeding and/or unauthorised parking may result in vehicles and drivers being banned from site.

All persons driving STFC, hire or personal vehicles on council business must obtain an STFC permit to Drive

Pedestrians

Stay alert and avoid distractions, such as mobile phones. Use the footpaths where provided and check for vehicles and cyclists before crossing a road.

Cyclists

Cycle on the road; the footpaths are for pedestrians. At night be visible and make sure your bike is fitted with good, functional lights.

All staff, tenants and users

Radios and headphones, where permitted, MUST be used at a suitable volume to enable fire and other hazard warning alarms to be observed.







Safety Signs

Safety signs provide vital warnings and instructions to help protect you from potential harm.

The main types of safety signs are:



RESTRICTED ACCESS AREAS

Due to the nature of the science undertaken at RAL there are many areas on site that have strict access controls due to the safety hazards present. These are often invisible hazards, for example:

- ionising radiation
- hazardous chemical substances
- biological laboratories
- high power lasers
- oxygen depleted atmospheres
- fire suppressant systems.



Restricted access areas include certain laboratories, workshops, plant rooms, roofs and experimental facilities. They can normally be identified by safety warning signs at the entrance points to these areas.



This is the ionising radiation warning symbol. It is used to identify radioactive sources, X-ray generators and areas with restricted access due to the ionising radiation risks.

You must not enter a restricted access area unless you've been authorised to do so or are being escorted by an authorised member of staff.

If you have been authorised to enter a restricted area then **you must** abide by all the local safety rules for the area at all times.



ENVIRONMENT

Waste Management

All waste is controlled at RAL (see SHE Codes 31 and 21). Specific disposal and recycling procedures are in place for certain items such as metal, paper, batteries, oils, printer cartridges and sharps.

Do not throw hazardous waste in general waste bins and skips.

Do not dispose of hazardous liquids via sinks or drains – special drain consents may apply.







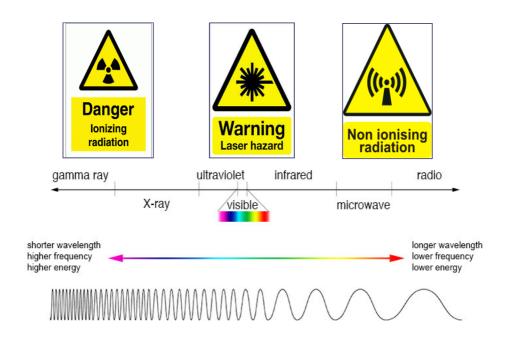
For waste chemical disposal contact the SHE Group for further advice.

Spillages

It is important to protect the environment by preventing hazardous substances entering the local water courses, particularly via the site surface water drains. Site spill kits are available to deal with external emergency spills on roads etc.

Site spill kits should not be used for smaller liquid spills within workshops or laboratories. Groups responsible for such areas should have purchased and placed spill kits locally to deal with such events.

IONISING AND NON-IONISING RADIATION



Access to these areas is strictly controlled and requires authorisation, specific precautions, training and ongoing supervision.

You must not enter unless permitted to do so, or you are under constant escort by an another authorised user.



You must follow any relevant local rules, safety instructions and standing orders at all times.

You must also use any specified PPE where you are instructed to do so.

MAGNETIC FIELDS

Areas where there are strong magnetic fields will be highlighted and delineated, with restricted access.



There are specific risks for those who may have certain implanted medical devices if entering such areas, for example:

- · Replacement artificial joints, plates and pins
- Cardiac pacemakers
- Implantable nerve stimulators and cochlear implants
- Implantable active drug administration and monitoring devices.

You must be sure to inform the person in charge of the area if you have one of these devices.

If you are authorised to enter, beware loose metallic objects, which may be affected by magnets.

CRYOGENIC LIQUIDS

Cryogenic liquids are used extensively on site, either for process / equipment cooling e.g. lasers and magnets, or for long term sample storage.





There are extensive fixed installations and many mobile cryogenic storage vessels (dewars) on site.

Contact with cryogenic liquids or vapours can cause severe eye and tissue damage, and if the liquids are spilled their expansion into gas can deplete oxygen in the atmosphere. Oxygen monitoring is required in many areas.

Do not enter areas where cryogens are used unless permitted to do so and you have received relevant training.

Do not enter areas if oxygen depletion alarms are sounding.



ASBESTOS

The RAL site was constructed when asbestos was routinely used in building construction. Many buildings and some plant and equipment still contain Asbestos Containing Materials (ACMs).

ACMs do not pose a significant health risk provided they are in good condition, left undisturbed and properly managed. The risk only arises if asbestos fibres are released and become airborne, e.g. through damage or disturbance of the ACM.

We therefore have comprehensive asbestos management arrangements in place.

All new starters should complete the Asbestos Essentials online training course by the end of their first month.

Risk Prevention

Despite an extensive site asbestos register at RAL it is not possible to know exactly where all asbestos is located.

staff **must not** damage or disturb the fabric **of any building**, e.g. by drilling noles in walls, or moving floor or ceiling tiles, without permission from Estates.

Only contractors authorised by STFC's Estates Department are permitted to manage or carry out work involving ACMs.

Emergency Action

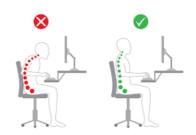
In the event of any ACMs (or suspected ACMs) being damaged, disturbed or exposed you must:

- stop work and evacuate the area
- contact Estates immediately for emergency assistance by calling x6644 from any site landline
- prevent other people from entering the area until a member of the Estates team arrives to evaluate the situation
- report the incident online via SHE Assure.

DISPLAY SCREEN EQUIPMENT (DSE)

Computer use is an everyday activity for most of us, but if we don't use our computers properly and adopt bad, static postures for extended periods then problems can develop.

It's important to do some basic training in computer and workstation set up, and a formal DSE assessment to see if you need any specialist equipment.



If you have any health issues which you associate with DSE use, then please raise them with your Line Manager, or contact SHE Group for further advice.

SHE Group has a limited range of ergonomic DSE equipment, which you can 'try before you buy' - contact them for a list of what's available.

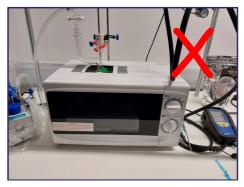
ELECTRICAL EQUIPMENT

There are some basic things to be aware of when using electrical equipment...

Before using equipment look for obvious signs of damage (e.g. scorch marks, cracked plugs, frayed cables, loose cable grips or damage to plugs or casings) and inappropriate modifications.

Report any defects, to your Line Manager, area PAT officer or Estates.

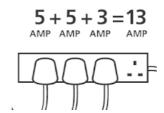






One plug per socket outlet.

Don't overload extension leads and no extension lead 'daisy chains'.





LONE WORKING

Lone Working is an activity carried out in isolation from other workers without close or direct supervision.

Low risk 'office type' activities may be allowed, but with additional arrangements agreed for communication and ensuring access to help in an emergency.

High risk activities are identified in local Risk Assessments (RAs), and include specific provision to monitor lone workers, e.g. pre-determined check-in arrangements via telephone, formal buddy systems, or lone worker alarms.

Some activities may be prohibited for lone workers and these must be clearly identified in the RA. Discuss what work is / is not permissible with your Line Manager, and any local arrangements for managing lone work.

Reception areas in some departments may have lone worker alarms, for use in those areas.

BUSINESS TRAVEL

Anyone driving on STFC business is required to obtain a permit to drive – whether travelling in their own car or in a hire car, in the UK or overseas.





High mileage business drivers (>3000 miles a year) are required to do defensive driving training. A car safety pack loan is available from Security.

Travellers on STFC business overseas must register their travel and obtain approval to travel from their Head of Department.

SLIPS, TRIPS AND FALLS

In 2012, the Health and Safety Executive identified slips and trips as being the most common cause of injury at work, causing an average of 40 per cent of all reported major injuries.

The nature of the work at RAL means that workspaces can become cluttered with tools, equipment and cables.

You can help by:

- Adopting a tidy as you go approach to work
- Removing boxes and packaging materials when not in use
- Routing cables away from walkways
- Reporting defects in flooring surfaces, or stairs
- Reporting defective equipment that might cause a fall, such as chairs, ladders etc
- Cleaning up spillages when you make them, or placing signage to identify the wet area
- Reporting near misses.

MANUAL HANDLING

The Health and Safety Executive define Manual Handling as transporting or supporting a load by hand or bodily force and includes lifting, putting down, pushing, pulling, carrying or moving loads.

Many tasks at RAL involve some element of manual handling and even seemingly innocuous tasks may result in pain or discomfort.

How you can help:

- Don't move items you don't need to
- Assess the items that you need to move
- Use mechanical handling devices
- Adopt good lifting practices.
- Carry out manual handling training
- Report injuries and near misses.







CONSTRUCTION AND SITE WORKS

Due to the rapid expansion of the RAL site, there are frequently contractors on site.

Large projects may require a segregated area to be allocated to contractors for the duration of the works under CDM (Construction, Design and Management) Regulations 2015.



RAL staff are not to enter these areas without permission from the contractor's foreman.





BUILDING AND SITE MAINTENANCE

If you need help with a maintenance issue.

Emergencies

During office hours, please phone faults through to ext. 6644 (01235 446644).

Outside of office hours ring Security on ext. 5545.

Estates emergencies are: loss of power, major water leak or gas leak.

FIRE SAFETY MANAGEMENT

At RAL we have a tiered fire safety management structure, starting with the Fire Safety Advisor and Technician (part of the SHE Group).

At the local level there are Building Fire Managers and Building Wardens.

The RAL site Alarm Investigation Team (AIT) responds to alarms and fires, and coordinates any emergency response if necessary.

Some basic fire safety instructions:

- Do not obstruct fire doors or obstruct fire escape routes
- Do not move or tamper with fire extinguishers
- No smoking within 5m of any building, combustible materials, or in a designated No smoking area
- Know your Building Warden and familiarise yourself with emergency fire exits, the sound of the fire alarm in your work area(s) and the location of your fire assembly point
- Ensure the safe storage of all flammable and combustible materials.



RAL fire alarm tests are performed weekly – building timetables are available from Estates Services.

Alarm 'tests' are generally intermittent ringing, 'real' fire alarms ring continuously. Some new buildings at RAL have voice commands.

Visitor safety management arrangements are the responsibility of their STFC host.

FIRE SAFETY MANAGEMENT

Do you have mobility issues that might impede your ability to leave a building and get to an assembly point in an emergency?

Do you have a health problem that might impact your ability to hear or see an alarm and delay your exit?

If so, it's important to let your Line Manager know – you may need a Personal Emergency Evacuation Plan (PEEP).

In the event of any fire alarm sounding...

- Evacuate immediately via your nearest fire exit, but do not run
- Do not return to collect personal items
- Encourage others to leave, but don't linger if they resist
- · Shut nearby doors and windows as you exit
- Go to the building's designated fire assembly point and wait there
- If it is necessary for you to leave the assembly point you **must** report to the Building Warden **before** doing so.

Some RAL buildings have flashing beacons at exits, these continue to flash even if the fire alarm is silenced.



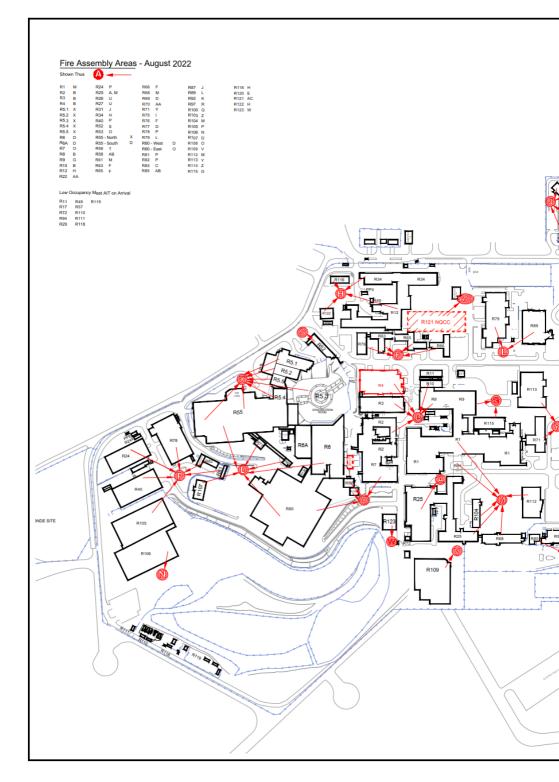
Do not enter the building while beacons are flashing.

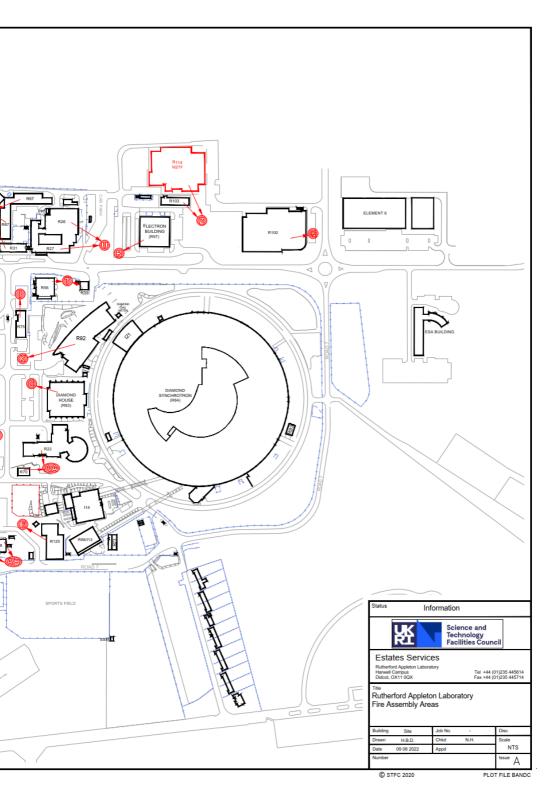
ASSEMBLY POINTS

RAL is a large and complex site, make sure you know the emergency exits and the assembly point for the building or buildings you occupy.

Site fire assembly points are shown overleaf.







EMERGENCY RESPONSE

For significant incidents call Security:

01235 778888 from a mobile phone.

2222 from landline (if available in your locality) or Zoom

Emergencies may include:

- Emergency First Aid (if immediate local first aid support is unavailable)
- Fire
- Oxygen depletion or gas alarms
- Safety rescue.

Site Security will coordinate any Emergency Service response.

Do not enter any area where an alarm is sounding or a beacon is flashing – the site Alarm Investigation Team (AIT) will investigate all alarms.

FIRST AID

RAL has both a local and site-wide First Aid and AED (defibrillator) response.

Local First Aiders are listed on local notice boards and on the SHE Website, along with their contact numbers. Look out for notice boards like this one as you move around site.

This example contains a defibrillator as well as a first aid kit and contact information. Defibrillator locations are shown on the map on pages 24 & 25.

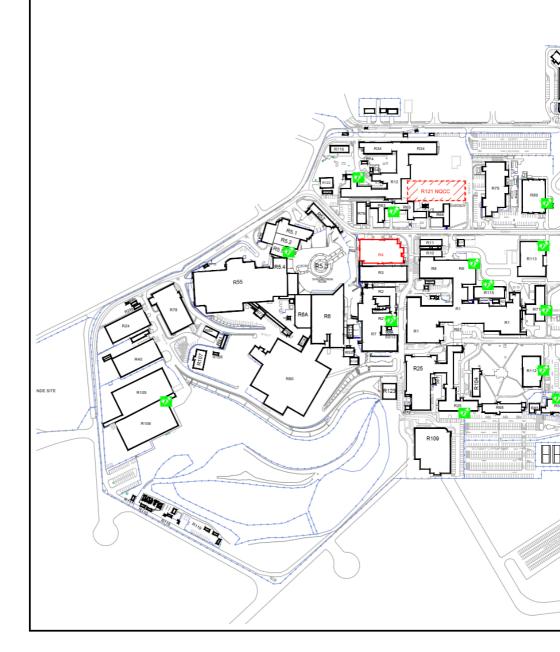


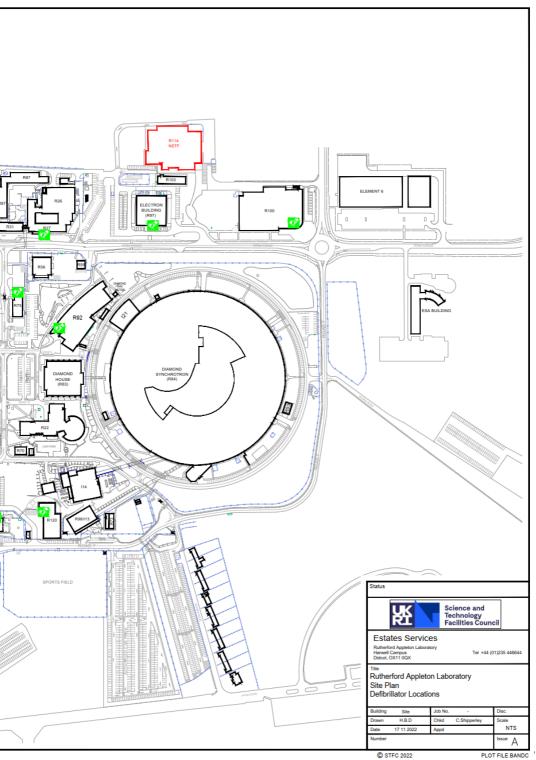
Use of eye wash bottles or items from first aid kits is to be reported to your local First Aider or Line Manager.

Intentionally blank.

BUILDING SCHEDULE

BLDG.	LOCATION OF DEFIBRILLATORS	BLDG.	LOCATION OF DEFIBRILLATOR
12	GC 26 - Fover	Fora	GC.01 - Entrance Lobby
15.5	Main Control Room - 1515	R92	GU.01 - Cafe
69	GC.01 - Entrance Lobby	R97	GC.02 - Reception
112	G.01A - Training Room	R100	G.56 - Reception Office
25	GC.09 - Steins Lobby - South Car Park	R106	GC.01 - Entrance Lobby
127	GC.01 - Reception	R112	GC.01 - Entrance Lobby
858	GC.01 - Entrance Corridor	R113	G.01 - Foyer
865	GC.04 - Link to RE3	R115	GC.01 - Entrance Lobby
R71	GC.02 - Fayer	R120	GC.01 - Entrance Lobby
875	GC.03 - Main Entrance Lothry (& in each security van)	R123	TBC





HEALTH AND WELLBEING

STFC values both the physical and mental wellbeing of its staff, and has established a network of **Mental Health First Aiders**.

They are an initial point of contact if you, or someone you're worried about, are feeling emotional distress. They're not therapists but can provide initial support, and point you to appropriate help, if you need it.



A full list can be found on the SHE website.

STFC also supports staff via an **Employee Assistance Programme** or EAP, with access to a service called Health Assured.

The service provides support for mental health and other issues (e.g. financial or legal support) and is completely confidential.

Further information can be found on the STFC staff intranet – The Source.

HEALTH AND WELLBEING

RAL has an on-site **Occupational Health** centre, with service provision by an external provider, TP Health.

Your Line Manager will discuss your work activities with you and the need for any referral to OH for health surveillance.

You must inform your Line manager if you have a health condition that may affect your ability to undertake certain tasks within your role, as adjustments may be necessary.



Note. This is **not** a drop in centre for first aid or the treatment of minor ailments.

Notify your Line Manager immediately if you believe you may have a health-related issue which has been caused, or made worse, by work.

A range of work-related medicals are conducted, and health surveillance can be arranged if necessary, for example:



Audiometry



Fitness to drive



Radiation classified workers



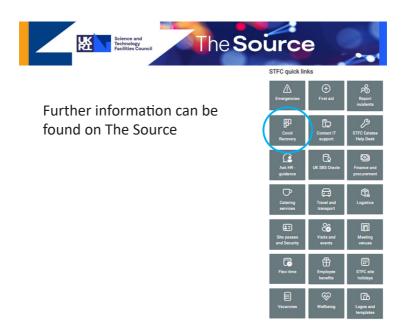


Hazardous substances

HEALTH AND WELLBEING

STFC has reverted to Operational Alert Level 1 following our response to the **Covid** pandemic, but some precautions remain in place, including the provision of hand sanitiser at high usage points and ensuring safe ventilation levels in work areas.

Carbon dioxide monitors are in use in many departments around the site and departmental managers can request them for their areas.



INCIDENT REPORTING

All work-related **incidents** must be reported, regardless of how minor. This is so that action can be taken to prevent something similar from happening and we can learn and improve.

Examples of incidents that must be reported at RAL or when working offsite on Council business are:

- Injuries
- Near misses or hazardous conditions
- Failures of safe systems of work
- Environmental incidents (e.g. spills)
- Vehicle incidents
- Fires and fire false alarms.



Injuries



'Near Misses' - mishaps and lucky escapes!



Hazardous situations

Incidents must be reported on Evotix via the SHE Website 'Report Incident', providing as much detail as possible in the report including:

- what happened
- who was involved
- where and when it happened.



INCIDENT REPORTING

If we consider the relative number of accidents resulting in serious injury compared to 'near misses', this is the picture we tend to see, with significantly more near misses than injuries.

Thankfully the number of major injuries is generally low, due to good safety management, but we do continue to see unsafe acts or omissions and near misses every day.



It's important to monitor **and** to learn from them. It helps minimise the potential for more serious accidents to occur.

Some examples of near misses to be reported:

- A heavy object falling over or being dropped
- Failure of a piece of equipment with potential safety implications
- Failure to follow a safe system of work or written procedures
- Uncontrolled exposure to hazards e.g. chemicals, radiation, electricity, etc
- Failure to respond as required to an emergency or fire alarm
- Using faulty equipment, or equipment with an expired test date
- Vehicle incidents
- Environmental incidents

Report anything that has the potential to injure or cause harm to others

STFC and the other Research Councils as well as Innovate UK and Research England now operate under the UKRI Health and Safety Policy, and each has developed its own Health and Safety Management Arrangements to put the UKRI Policy into effect.

UKRI is developing a suite of high level Health and Safety Codes on key safety topics, which each Council has expanded to cover their specific operations.

STFC's SHE Codes are the primary source of Health and Safety information for STFC staff on all its sites and interpret UK Health and Safety legislation in the context of our activities.

UKRI
H&S Policy

UKRI
H&S Codes

STFC H&S
Management
Arrangements

STFC H&S
Codes

There are currently around 40 Codes, with others in development. Check the list on the SHE website for any Codes that will apply to your work. Each code has a short online BiteSize summary to help you.

The Codes set out roles and responsibilities. Check which ones apply to YOU and ensure you implement them.

Relevant training is also listed in an appendix for each STFC Code.



The SHE Management System follows the 'plan-docheck-act' approach and is based on two vital key principles:

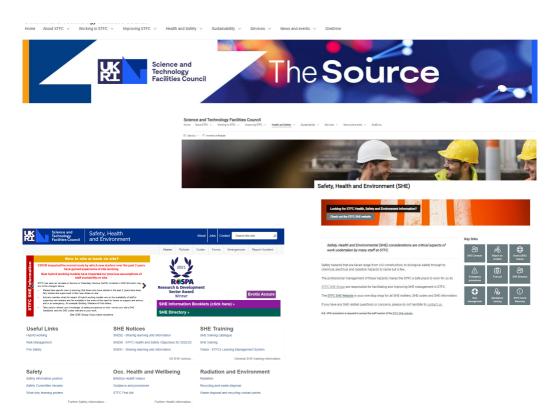
- that safety management is an explicit line management responsibility – not forgetting everyone has a legal responsibility to work safely and not endanger others; and
- that Risk Assessment (RA) is the primary means by which we assess SHE hazards before undertaking work activities or tasks.



STFC places a great deal of emphasis on:

- Setting out standards of performance in SHE management these are in our H&S Arrangements
- Assigning roles and responsibilities for SHE management these are in our SHE Codes
- Training and competency in our managers and staff
- Proactive incident reporting and investigation
- Sharing the learning from accidents and non-injury incidents, near misses or 'mishaps'
- Commitment to continual improvement by monitoring and audit.

STFC's SHE management system is based on the Health and Safety Executive's (HSE) Guidance Note HSG65



Risk Assessment (RA) forms a vital part of STFC's safety management arrangements.

A Risk Assessment is basically a careful examination of what, at work, could cause harm.

It's a structured, systematic way of identifying risks and ranking them, so that control measures can be targeted at the significant risks first.

All workplaces have a legal duty to identify and document their Significant Risks, but crucially it's not just about paperwork – it's the process and implementation of the RA findings that keeps everyone safe, including YOU.

We can only do great science safely if everyone works together to implement and improve our SHE management arrangements.

Our policies and codes set out people's various SHE responsibilities.

All of our staff, regardless of position, have the following responsibilities:

Know your responsibilities



- 1. To take reasonable care of their own health and safety and that of other people who may be affected by their actions, omissions, and decisions
- 2. To cooperate with STFC on all SHE matters and support the implementation and on-going improvement of our SHE policies
- 3. To follow the SHE systems, codes, processes, procedures and precautions relevant to their work
- 4. To undertake relevant SHE training and apply the acquired knowledge and skills to their work
- 5. To report all work-related SHE incidents and concerns so appropriate action can be taken
- 6. To assist management with incident investigations and contribute towards the prevention of future incidents
- 7. Actively contribute to the production of Risk Assessments (RAs) for the work you do
- 8. Consider the need for an RA when planning for new work, and always in advance of the work starting
- 9. Know your limitations and always seek advice from your Line Manager if you are uncertain about any safety or resource issue.

34

SHE TRAINING

Training is vital for ensuring staff and others who work with us are competent to undertake activities where SHE hazards exist.

The following mandatory SHE training programme for all new starters at RAL is online:

- SHE Induction
- Fire Safety Awareness
- Safe Manual handling Note: Practical, tutor led manual handling training is also required for some staff. If applicableyou will receive an invitation to attend a session on site
- On-line Display Screen Equipment (DSE) course AND separate on-line workstation self-assessment
- Electrical Safety Essentials
- Asbestos Essentials
- STFC Health and Safety Management Arrangements.

You may require other specialist training depending on your role. This will be identified by your line manager, taking account of any relevant training requirements specified in STFC's SHE Codes.

If you manage staff you are also required to attend one of the following courses:

- STFC SHE Training for Technical Managers (3 days)
- STFC Health and Safety for non-technical Managers (0.5 day).

SHE TRAINING

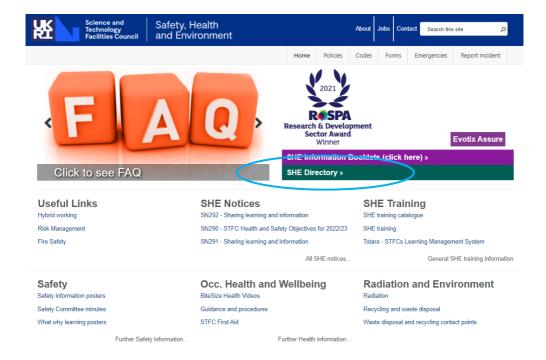
This course is only an overview of site safety arrangements, and you will be given further local inductions by your Line Manager.

Importantly, for all local work areas please ensure that you:

- Review relevant Risk Assessments
- Understand relevant control measures, method statements, work instructions or Standard Operating Procedures, and apply them
- Familiarise yourself with emergency arrangements be proactive
- Report deficiencies immediately to area managers
- Discuss SHE matters and concerns routinely in team meetings
- Attend (refresher) training when you are requested
- Attend Occupational Health appointments if you are required to.

SHE WEBSITE

The SHE website is a 'one stop shop' for Safety, Health and Environment information.



You can also find information about staff who have specific roles in SHE management, including the RAL SHE team.

The SHE website is accessable from a home or public compter, but not all content will be available. For full content, access via the STFC intranet.

PERSONAL FACTORS

Health and safety precautions taken at a site and local level will usually be sufficient to protect the majority of staff.

However some staff may need additional precautions to keep them safe and healthy at work. For example, this could be due to:

- lack of experience of the workplace or job
- a medical condition or disability
- cultural, literacy or language issues
- gender or age.

Typical examples of people who might be at an increased risk of injury or ill-health from their work include:

- New starters
- Pregnant women and new mothers
- Young workers (under 18 years old) and older workers
- Work experience students
- Anyone recovering from a serious injury or illness
- Staff with a disability
- Staff from overseas where language is a barrier.

Where health and safety vulnerabilities are clearly apparent, managers will proactively address any additional precautions that may be required with the person concerned, such as a Personal Emergency Evacuation Plan (PEEP).

For other, less apparent, issues (e.g. medical) that might have a health and safety impact it is vital that the person informs their manager or HR representative. This is so that the implications can be assessed and any necessary adjustments made to their work or workplace.

IMPORTANT SHE PARTNERS

Effective Health and Safety management relies on the support and commitment of ALL staff to make RAL safe.

Your Line Manager is your first contact for SHE issues related to your job, but other sources of support are available.

Departmental SHE Contacts (DSCs) liaise with the central SHE Group on behalf of their Department. RAL DSC contact information can be found in the SHE Directory.



Safety Representatives from our recognised Trade Unions also work to support safety management in STFC and actively participate in many site activities.

If you have concerns or queries related to safety then they are all available for advice.

KEY CONTACTS

YOUR DETAILS

Your Name	
Your Location	
Manager Contact number/details	

KEY CONTACTS

RAL Site Security (24/7 Emergency number)	Call 01235 778888 from a mobile phone; or x2222 from a site landline (if available in your location).
RAL Site Security (General Enquiries)	Call 01235 445545 from a mobile phone; or x5545 from a site landline (if available in your location).
RAL Estates Helpdesk	Self Service portal: https://tfcloud-stfc.technologyforge.com/ Email: RALhelpdesk@stfc.ac.uk For emergency assistance dial 01235 446644 from a mobile phone.
RAL Radiation Protection Advisers	Tel: Tel: 01235 445293, 445592 or 445594 Email: rpa@stfc.ac.uk
RAL Safety, Health and Environment Group	Tel: 01235 778288 Email: ralsafety@stfc.ac.uk
RAL Site Address	Science and Technology Facilities Council Rutherford Appleton Laboratory, Harwell Campus, Didcot, Oxfordshire, OX11 0QX General Enquiries: 01235 445000