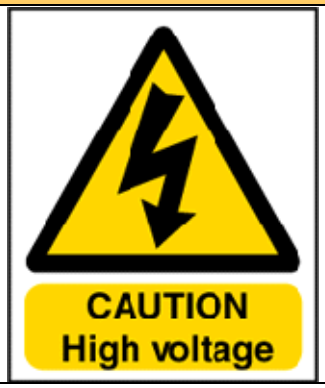
CENTRAL LASER FACILITY SAFETY PACKAGE

EMERGENCY TELEPHONE NUMBERS

Fire Brigade, Ambulance	2222 (24 hour)
Security Wardens	5545 (or from a mobile 01235 778888) (24 hour)
Site Safety Officer	5329 (Working hours)
Occupational Health Centre	6666 (Working hours)
First Aid (R1, R2, R7)	1865 (Working hours)
	1330 (Working hours)
	1839 (Working hours)
	1192 (Working hours)
First Aid (R92)	07780 956743 (Working hours)
	01235 567718 (Working hours)
	01235 567730 (Working hours)



Edition 14 – February 2012

Queries relating to this document should be addressed to B Wyborn (01235 821900 ext 5589)

BEFORE CARRYING OUT THE FOLLOWING ACTIONS
YOU MUST OBTAIN AUTHORISATION FROM THE APPROPRIATE PERSON:

- **Work on or near cranes – permits to work required (see page 7)**
- **Operate lasers (see page 9)**
- **Work on electrical apparatus (see page 12)**
- **Work with hazardous substances (see page 13)**
- **Work with biological materials (see page 13)**
- **Work with ionising radiations (see page 15)**
- **Connect, disconnect or modify toxic or high pressure gas supplies and vents (see page 16)**
- **Lift or move heavy loads (see page 16)**
- **Use machine tools (see page 17)**
- **Work with cryogenic liquids (see page 17)**
- **Work with naked flames or an alternative heat source (see page 18)**
- **Work alone in any area where there are hazards (see page 18)**
- **Work long hours i.e. more than 12 hours in a day (see page 18)**
- **Enter TAP Interaction or Compression Chambers or operate their vacuum system (see page 19)**
- **Build, alter or change use of buildings (see page 19)**
- **Work on roofs (see page 20)**

IMPORTANT DO's:

- **Stop and think about the hazards associated with the work you undertake – mentally assess the risks and if significant undertake a documented Risk Assessment**
- **Obey all safety signs**
- **Wear required Personal Protective clothing or Equipment (PPE)**
- **Observe the Highway Code on site and off**
- **Keep below the site speed limit of 20 mph**
- **Only park in designated parking areas**
- **Know the escape routes and assembly areas for your location**
- **If entering an area with a specific hazard ensure that you know any special precautions that must be taken**
- **Dispose of any items in an appropriate safe manner**
- **Follow any instructions issued for safety reasons**
- **Report accidents, near misses, dangerous situations, environmental incidents and shortcomings in the Safety, Health and Environmental (SHE) arrangements**

IMPORTANT DONT'S:

- **Eat or drink in work areas where there may be contamination present which could be ingested thereby leading to serious problems/sickness e.g. chemical, radiation, biological etc.**
- **Enter a controlled area without permission**
- **Misuse or abuse items provided for safety reasons**
- **Modify, in any way, interlock or control systems unless authorised to do so**

CONTENTS

1) INTRODUCTION

Rutherford Appleton Laboratory (RAL) is a research laboratory with a very broad programme of work. There are consequently a broad range of hazards present at the laboratory with which you may be unfamiliar.

The policy of STFC is to provide, as far as is reasonably practicable, healthy and safe working conditions for all who work at the laboratory whether or not they are employees, and to require that all these workers follow safe methods of working. The STFC Safety Policy has been published (December 2010). It spells out the laboratory's safety policy, safety standards, safety organisation and safety arrangements http://www.she.stfc.ac.uk/Policy/Health%20and%20Safety%20Policy.pdf.

The Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1992, Provision and Use of Work Equipment Regulations 1998, and Workplace (Health, Safety & Welfare) Regulations 1992 are relevant overarching safety legislation. Other specific regulations are listed under relevant sections.

Safety instructions are issued through corporate Health and Safety Notices, and safety advice through corporate Safety Information sheets. RAL/corporate Safety Codes provide instructions and advice on several potentially hazardous aspects of the work in RAL. These can all be viewed on the laboratory's internal web pages http;//www.stfc.ac.uk/SHE. (see also Appendix 1).

The purpose of this Safety Package is to provide more specific instructions as to how the RAL safety arrangements are to be applied within the Central Laser Facility (CLF) to the principal hazards found there and to list persons responsible for safety in the different areas.

The last version (Edition 13) of the CLF's Safety Package was produced in December 2010. Since then a number of staff and building changes have occurred. Also some additional safety information needed to be added. This version of the Safety Package replaces all previous editions and amendments. The instructions in this safety package supplement and carry the same force as, but in no way rescind, replace or modify, the relevant RAL/corporate Safety Codes and Notices.

2) RESPONSIBILITIES

John Collier, the Director of the CLF, is responsible for all safety matters within the department and through him responsibility rests with line management. Every supervisor must take such executive actions necessary to safeguard the personnel (whether visitors from universities and other organisations, contractors or employees) under their supervision. Supervisors also have a duty to ensure that adequate consultation with employees and their Safety Representatives is carried out regarding specific local issues, involving the Department Safety Committee where necessary.

A four-tier Safety Committee structure has been set up:

(i) The STFC SHE Committee monitors the capability of the STFC SHE management system, approving all changes to policy and supporting codes, reviewing performance and driving improvement.

(ii) The RAL Safety Committee provides an independent scrutiny on SHE management and performance to RAL management and promotes co-operation and communication between departments, managers, employees and trade union representatives. It fulfils the statutory responsibility for STFC to consult formally on safety matters with the trade unions and employee representatives. The membership includes safety representatives from the Trade Unions and representatives from the departments. Brian Wyborn is the CLF representative.

(iii) The ISIS, CLF & E-Science Safety Committee has the objective of inspection and monitoring of safety performance and bringing to bear on local problems the best experience to promote safe working and good health of all employees. The membership includes safety representatives from the Trade Unions and representatives from the departments. Brian Wyborn and Dave Clarke are the CLF representatives. Carole Denning is the secretary. Emma Belcher is the Safety Tour Organiser. Rob Clarke is a CLF staff representative.

(iv) Safety is a standing item on the CLF Senior Staff meeting agenda. All Group Leaders attend the meetings where accidents, safety audits and other safety related matters are discussed and actions monitored. Brian Wyborn is the CLF Departmental Safety Contact.

All personnel (whether visitors from universities and other organisations, contractors or employees) who work at the CLF have a responsibility to take reasonable care to avoid injury to themselves and others who may be affected by their acts or omissions. All personnel have a duty to co-operate with line management to achieve a healthy and safe workplace, must comply with safety rules and standards of RAL and the CLF, must refrain from any intentional or reckless acts which adversely affect safety and must inform CLF management of any dangerous situations and shortcomings in health and safety arrangements.

For particular hazards present in the CLF responsible and authorised persons have been appointed. These are listed later in the package.

Each area the CLF has an appointed Area Manager who has overall responsibility for the safe operation of the area. They appoint Area Safety Co-ordinators and deputies. These are listed later in the package. In addition major CLF projects will manage safety, often having safety committees.

The Safety Health and Environment (SHE) Group has advisory and executive functions to assist managers and employees on aspects of safety protection as laid out in the STFC Safety Policy.

3) CLF SAFETY PROCEDURES

This Safety Package is supplied to all members of the CLF staff, visiting scientists, sandwich students etc. and to all users working at the CLF. Users must register with the User Support Office each time they begin a session of work at the CLF. The Facilities User Office will ensure that the user is supplied with or has already got an up to date edition of the Safety Package.

An up to date version of the Package is available from the Facilities User Office or via the CLF's Web at http://www.clf.rl.ac.uk/User+Area/User+safety+information/13697.aspx or the CLF server at M:\Safety\CLF Safety Package.

Upon receipt of this package personnel must read it and act upon the contents therein. Copies of related Regulations, Codes of Practice, National Standards, RAL/STFC Safety Codes, Health & Safety Notices, and local rules are not included in this package but where relevant reference is made to them.

Staff and users must contact the Area Safety Co-ordinators before starting work in an area. The Co-ordinator will make personnel aware of the specific hazards in the area and will discuss and agree procedures for safe working. Where appropriate, nominated and authorised persons are appointed for ensuring that particular safety procedures are carried out by staff and users.

Users are responsible for the safety of their own experiment but a CLF member of staff (Link Scientist) is over all responsible for ensuring the safety of the users, their experiment, equipment and materials etc whilst at RAL. Experimental safety starts at the proposal stage where every effort must be made to identify any hazards (equipment, sample or procedure related) associated with the proposed programme of work. Users must discuss all safety issues they are aware of with the appropriate link scientist or area co-ordinator in the first instance and with specifically named CLF personnel where appropriate.

Users must notify the CLF in advance of any equipment or materials they wish to bring to RAL for their experiment. Failure to do so can lead to the delay or cancellation of the experiment. Such equipment must conform to RAL safety standards. Special rules for registration, inspection and monitoring apply to electrical equipment, lasers, high voltage apparatus, pressure and vacuum systems, radioactive materials, lifting equipment and hazardous substances (e.g. chemicals and biological agents).

Group leaders of visiting teams should agree arrangements in advance for the supervision of inexperienced or junior personnel.

For attached persons such as MSc, Sandwich and Vacation students a written project definition should be produced and signed by both the student and their supervisor. Based on the student's knowledge, experience etc, it may also be necessary to make a written risk assessment defining the limits of the student's work and for additional training to be undertaken.

Persons authorising visitors onto site are responsible for ensuring that they are made aware of general RAL safety procedures, that they are not exposed to unnecessary hazards and that they are sufficiently supervised whilst on site.

Those responsible for projects and experiments should ensure that before the start of any work the potential hazards are assessed and discussed with those involved, taking into account the necessary precautions and sources of advice. Where the potential hazard, or the age of those involved, or other criteria, make it appropriate, the assessment and where necessary a safe system of work, should be in writing and the responsible person and, where appropriate, the others involved, should sign the assessment. Any subsequent changes to the project or experiment should be reflected in the assessment.

A copy of all Standing Orders, Risk Assessments etc. should be available locally to the risk and upon request.

The training of all CLF staff and visitors in their safety duties is essential to the proper implementation of CLF safety policy. Individuals and line managers should ensure that appropriate training is undertaken. All employees are required to attend a general safety course soon after joining and then regular refresher courses. Specialist training should be arranged where necessary.

Personnel who have a health problem which could affect their work and cause a hazard to themselves or others, must ensure that the Area Safety Co-ordinator and the Occupational Health Centre are made aware of the problem and of the appropriate procedures to be taken in the event of a problem.

Safety related incidents/matters should be communicated via relevant line management to the appropriate level and to the department safety representatives if necessary.

This is a research laboratory with a broad programme of work. Experimental arrangements change frequently. There will be hazards with which you are unfamiliar. You must therefore make yourself aware and maintain awareness of the hazards in the area you are working in, adhere to the instructions given in this document and follow any instructions given locally.

4) GENERAL RAL SAFETY

The procedures to be followed in the event of a fire are given in RAL SN30, in the event of a Site Emergency in SN35 and in the event of accidents or illness in STFC SHE Code 5. These are summarised below. SN29 gives rules for fire prevention measures. In addition RAL has drawn up a Incident/Emergency Response Plan. This is summarised in Appendix 2.

Fire

If you discover a fire:-
a) Break the nearest break-glass alarm.
b) Warn others of the fire locally.
c) Call 2222 (or 01235 778888 from a mobile), report to Security the nature and exact location of the fire.
d) Use appropriate fire extinguisher if it is safe to do so. Report any extinguisher used so that it can be replaced. Please note that a CO_2 system is installed in the Vulcan Pulsed Power Room and specific operating procedures are in place.

When you hear the fire alarm:-
a) Leave the building immediately by the nearest exit, if possible close doors and windows and leave equipment in a safe state.
b) Do not use the lift.
c) When outside go to the assembly area. For a fire in R1 this is on grass to the east of R61 (Assembly Point M). For R2 and R7 the assembly area is to the North of the Vulcan Capacitor Room (Assembly Point B). For R92 the assembly point is in front of the building (Assembly Point K). Please make yourself familiar with these locations (see site plan in this package).
d) Check for the presence of colleagues and give names of unaccounted persons to the Senior Fire Officer or other appropriate person.

Site Emergency

This refers to a release of a significant amount of radioactive material or other toxic material.
A klaxon will sound - an interrupted note for warning
- a continuous note for the all clear.

On hearing the klaxon:-
If outside enter the nearest main building.
a) Remain inside and obey instructions given by the building warden.
b) Close all windows and doors, skylights and louvres.
c) Close down ventilation plant or fans that draw air from the outside.
d) Do not use the telephone system except for calls connected with the incident or other emergencies.

Injury or Illness

In the event of a minor injury or illness during working hours - contact a local First Aider (see contact details below)
If the identity and location of the nearest First Aider is not known see web http://staff.stfc.ac.uk/she/firstaid/RAL/Pages/default.aspx, or contact Security out of hours ext. 5545 for further advice;

In the event of a serious injury or illness.
a) Contact Security on 2222 (or 01235 778888 from a mobile), they will determine whether emergency services are summoned without delay and despatch local First Aiders to the incident.
b) If you have a medical condition that may be relevant in a first aid situation, for example, diabetes, please let your First Aider know as a precautionary measure. This information will be treated in strictest confidence.

First Aid

A First Aid Team provides support in emergency situations, especially in those first minutes before the emergency services arrive, and to treat minor conditions where highly qualified medical help is not needed.

N.B. The above procedure does not prevent those with minor first aid requirements, minor cuts etc, contacting their local first aider directly.

Your nearest First Aiders and contact details are below (see http://staff.stfc.ac.uk/she/firstaid/RAL/Pages/default.aspx)

Donna Wyatt	R1	1330
Rob Clarke	R1	1839
Rob Heathcote	R1	1192
Tony Kershaw	R2&R7	1268
Kevin Jones	R2&R7	1426
Rob Searle	R2&R7	1957
Leslie Jones	R2&R7	1267
Adrian McFarland	R2&R7	1407
Andrew Allan	R92	07780 956743

Victoria Green	R92	01235 567718
Jo Nettleship	R92	01235 567730

Accident or Dangerous Occurrence Reporting

All accidents resulting in injury or near miss incidents must be reported promptly to line and area management and a report entered in 'SHE Enterprise', the incident reporting database - http://hsweb2.dl.ac.uk/sheenterprise/default_user.htm or by using the equivalent incident reporting pro-forma and sending it to the local SHE group. Major incidents should be reported within 12 hours and all others within 2 working days. All incidents occurring on council sites and those involving staff whilst working or travelling offsite on Council business should be reported. See STFC SHE Code 5 for details.

Line managers must conduct appropriate local investigations of any incident for which they are the responsible manager and report their conclusions as to the root causes of an incident and any proposed actions to mitigate against a recurrence to their line management, copied to the local SHE group. For Serious or Potentially Serious (SoPS) incidents a written report will be required and for those incidents involving death, serious injury, or the potential for such a Board of Enquiry will be convened to investigate.

Risk Assessments

The Management of Health & Safety at Work Regulations 1999 requires employers to make suitable and sufficient risk assessments where hazards exist. Significant findings must be recorded. STFC SHE Code 6 lays out the procedures at RAL.

Those responsible for projects or experiments must ensure that before the start of any work the potential hazards are assessed and discussed with those involved, taking into account the necessary precautions and sources of advice. Where appropriate risk assessments should be documented and entered into 'SHE Enterprise', the central risk assessment database (http://www.stfc.ac.uk/SHE/SHE+Enterprise/21432.aspx).

Permits to work

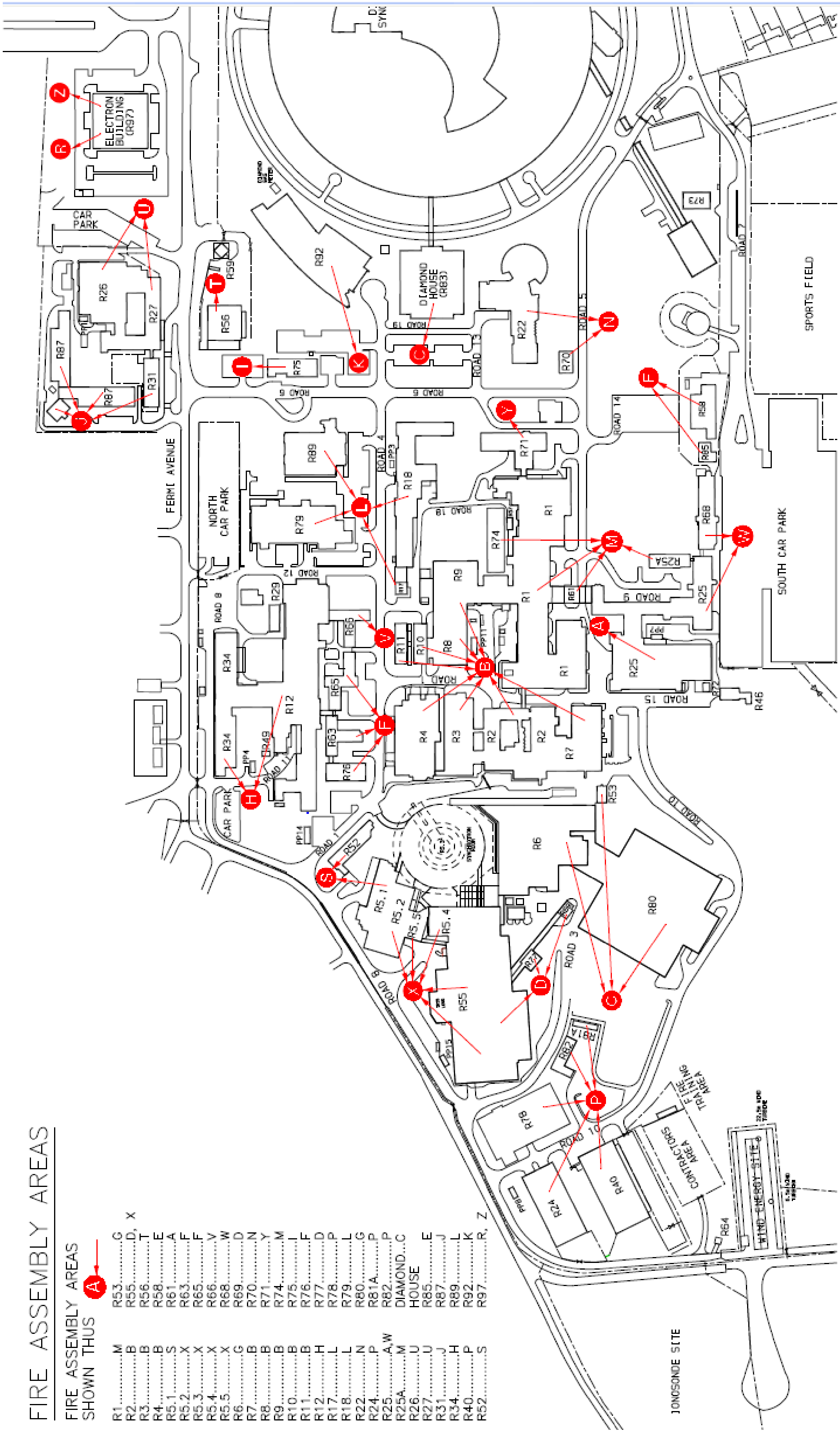
Permit-to-work systems are used for work in certain areas of the CLF particularly where there could be a hazard, for example from electrical installations, radiation, work on cranes, hot working, work at heights or in confined spaces. Personnel should consult with the relevant Area Safety Co-ordinator before starting this type of work.

Personal Protective Equipment (PPE)

The Personal Protective Equipment (PPE) Regulations 1992 requires employers to provide suitable personal protective equipment where appropriate. Such PPE must be maintained in good working order, adequate instruction in its use provided and employers also need to ensure that PPE is used properly.

Where relevant PPE has been provided i.e. goggles, overalls, gloves, shoes etc, it should be used. Any loss or defect in PPE should be reported as soon as possible.

SITE PLAN


FIRE ASSEMBLY AREAS
FIRE ASSEMBLY AREAS SHOWN THUS A
R1............M
R2............B
R3............B
R4............B
R5.1..........S
R5.2..........X
R5.3..........X
R5.4..........X
R5.5..........X
R6............G
R7............B
R8............B
R9............B
R10...........B
R11...........B
R12...........H
R17...........L
R18...........L
R22...........N
R24...........P
R25...........A,W
R25A..........M
R26...........U
R27...........U
R31...........J
R34...........H
R40...........P
R52...........S
R53...........G
R55...........D, X
R56...........T
R58...........E
R61...........A
R63...........F
R65...........F
R66...........V
R68...........W
R69...........D
R70...........N
R71...........Y
R74...........M
R75...........I
R76...........F
R77...........D
R78...........P
R79...........L
R80...........G
R81A..........P
R82...........P
DIAMOND...C
HOUSE
R85...........E
R87...........J
R89...........L
R92...........K
R97...........R, Z
ELECTRON BUILDING (R97)
CAR PARK
FERMI AVENUE
NORTH CAR PARK
DIAMOND HOUSE (R83)
SOUTH CAR PARK
SPORTS FIELD
IONOSONDE SITE
CONTRACTORS AREA
FIRE TRAINING AREA
WIND ENERGY SITE

5) AREA MANAGERS AND SAFETY CO-ORDINATORS

The arrangement of safety responsibilities within the CLF has been described earlier in this package. The Area Safety Co-ordinator is responsible for the day to day safe operation of the area in all aspects. They must consult with the relevant responsible and authorised person on particular hazards. In particular, co-ordinators are responsible for authorising all work with safety implications within their area. It is also the co-ordinator's responsibility to assess the safety aspects of proposals to work in their areas, to maintain user safety awareness, and to ensure that any appropriate Standing Orders, Risk Assessments etc. have been prepared, displayed and personnel are aware.

The following people have been appointed as Area Managers and Area Safety Co-ordinators:

Facility (Bldg)	Area	Manager	Co-ordinator	Deputy Co-ordinator
Vulcan R1	Control Room	I Musgrave	A Kidd	D Pepler
" "	Laser areas 1, 2 & 3	I Musgrave	A Kidd	D Pepler
" "	Laser Area 4	I Musgrave	A Kidd	D Pepler
" "	South Control Room & Support Areas	R Clarke	R Heathcote	M Notley
" "	Target Area West	R Clarke	M Notley	M Galimberti
" "	Target Area East	R Clarke	M Notley	R Heathcote
" "	Pulsed Power Room	I Musgrave	P Holligan	
" "	Front End Rooms	I Musgrave	D Pepler	
" "	Target Area Petawatt	R Clarke	R Heathcote	M Notley
" "	Target Area Petawatt Control Room	R Clarke	R Heathcote	M Notley
" "	Target Area Petawatt Mezzanine	R Clarke	R Heathcote	M Notley
" "	Target Area Petawatt Plant Room	B Wyborn	P Rice	S Blake
" "	Vulcan Plant Room 2	B Wyborn	B Landowski	S Blake
" "	Vulcan Plant Room 3	B Wyborn	B Landowski	S Blake
" "	AO Development Lab	I Musgrave		
" "	10PW seed source development lab	I Musgrave	W Shaikh	
" R2	Clean Rooms and Interferometer Room	I Musgrave	T Winstone	A Frackiewicz
	Amplifier and FlashLamp Test Area	I Musgrave	T Winstone	D Robinson
" "	Darkroom	I Musgrave	D Pepler	T Winstone
LSF R92	User Control Room G58	D Clarke	P Matousek	A Parker
" "	SORS	D Clarke	M Pollard	M Towrie
" "	Nanoprobes & Ar+	D Clarke	P Burgos	S Botchway
" "	Raman/AFM	D Clarke	S Roberts	S Needham
" "	Laser Office	D Clarke	P Matousek	
" "	Bio Lab	D Clarke	S Botchway	S Roberts
" "	Chemical Lab	D Clarke	B Coles	I Clark
" "	Analytical	D Clarke	B Coles	I Clark
" "	Loan Pool	D Clarke	I Clark	G Greetham
" "	ULTRA Laser 1 (G.44)	D Clarke	G Greetham	I Clark
" "	Tweezers (G.45)	D Clarke	A Ward	I Clark
" "	User Control Room (G46)	D Clarke	A Ward	I Clark
" "	ULTRA R&D Area (G.47)	D Clarke	I Clark	G Greetham
" "	ULTRA Laser 2 (G.48)	D Clarke	G Greetham	I Clark
" "	User Control Room (G.52)	D Clarke	I Clark	G Greetham
" "	ULTRA Raman Area (G.49)	D Clarke	I Clark	G Greetham
" "	ULTRA IR Area (G.53)	D Clarke	G Greetham	I Clark
" "	User Control Room (G.31)	D Clarke	S Botchway	S Webb
" "	Sample Area (G.32)	D Clarke	S Botchway	S Webb
" "	Sample Area (G.34)	D Clarke	S Botchway	S Webb
" "	User Control Room (G.35)	D Clarke	S Botchway	S Webb
" "	Laser Area	D Clarke	S Botchway	S Webb
" "	Sample Area (G.37)	D Clarke	S Botchway	S Webb
" "	User Control Room (G.38)	D Clarke	S Botchway	S Webb
ESG R1	Target Prep. Lab	M Tolley	C Spindloe	
" "	Instrumentation Lab	R Clarke	M Notley	

“	“	Dark Rooms	R Clarke	R Heathcote	
“	R2	Rad Lab	R Clarke	R Clarke	R Heathcote
Eng.	R1	Cellar	B Wyborn	B Landowski	S Blake
“	“	Mechanical Workshop	B Wyborn	B Landowski	S Blake
“	“	Pulsed Power Area	B Wyborn	M Pitts	
“	R2	Mechanical Assembly Area	B Wyborn	D Neville	P Rice
“	“	Electrical Workshop	B Wyborn	M Pitts	G Wiggins
“	R7	Electrical Store	B Wyborn	M Pitts	G Wiggins
“	“	Mechanical Stores	B Wyborn	B Landowski	S Blake
Astra	R7	Control Room	R Pattathil	S Hawkes	C Hooker
“	“	Laser Areas 1 & 2	R Pattathil	S Hawkes	C Hooker
“	“	Astra Gemini Laser Area 3	R Pattathil	C Hooker	
“	“	Storage Area (mezz)	R Pattathil	S Hawkes	C Hooker
“	“	Artemis	R Pattathil	E Springate	E Turcu
“	“	Target Area 2	R Pattathil	D Symes	P Foster
“	“	Target Area 2 Control Room	R Pattathil	P Foster	D Symes
“	“	Astra Gemini Control Room	R Pattathil	S Hawkes	C Hooker
“	“	Astra Gemini Viewing Room	R Pattathil	S Hawkes	C Hooker
“	“	Astra Gemini Target Area 3	R Pattathil	P Foster	D Symes
“	“	Astra Gemini Target Area 3 Control Room	R Pattathil	P Foster	D Symes
“	“	Astra Gemini Services Area	B Wyborn	D Neville	S Blake
“	R1	Gemini Set-up Lab (5A)	R Pattathil	D Symes	N Booth
R&D	R2	10 PW Front End	I Musgrave	Y Tang	
“	“	10 PW component facility	I Musgrave	M Galimberti	
“	“	Vulcan HAPPIE Lab	I Musgrave		
“	“	Dipole	K Ertel	P Mason	
“	“	Laser R&D Lab 1	C Hernandez-Gomez		
“	“	Laser R&D Lab 2	C Hernandez-Gomez		

6) BUILDING WARDENS

The following people have been appointed as Building Wardens to function in the areas stated in the event of a Fire or Site Emergency. For further information see RAL HSN 36.

Building Wardens

Area	Building Warden	Deputy
Building R1		
Vulcan	A Kidd	M Galimberti
Ground floor W wing	D Wyatt	
1st floor W wing	P Brummitt	T Strange
2nd floor W wing	L Miles	
Upper Ground floor N wing	S Blake	
Building R2		
Clean Rooms, Interferometer Room and R&D Labs.	A Frackiewicz	P Mason
Building R7		
ESG Target Area, Astra , Stores & Workshops	G Wiggins	D Symes
Building R92		

7) LASER RADIATION SAFETY

There are many lasers in the CLF that can cause permanent damage to the eye or skin burns through a momentary exposure to the beam or a reflection. Exposure of the skin or eyes to UV radiation is potentially carcinogenic. There are many (and variable) wavelengths from the UV through the visible to the IR operating simultaneously and experimental configurations are frequently changed. Appearances can be dangerously misleading. What seems to be a steady beam may be rapidly pulsing with a peak power more than a million times its average. Weak looking blue or red beams may be at wavelengths where the eye is several thousand times below its peak sensitivity. UV and IR beams cannot be seen at all. Constant care and awareness is therefore needed when working with lasers.

The STFC safety policy for the use of lasers is defined in Safety Code 22. These instructions explain the safety procedures to be followed by personnel working with lasers in the Central Laser Facility.

Each laboratory housing hazardous lasers has an appointed Laser Responsible Officer (LRO) who is responsible for laser radiation safety in that laboratory.

Before personnel start to work in any of these laboratories they must obtain the permission of the appropriate LRO. After authorisation has been obtained personnel must obey any Standing Orders, Operating Procedures or Personal Operating Limits set by the LRO. No significant changes may be made to laser beampaths, beam frequencies, or safety devices, or new lasers introduced to a laboratory without the authorisation of the LRO.

All users of laser systems must have seen the video 'LIMITS - Laser Safety in Industry and Research' before being given permission to work in an area. For access to the video contact the User Support Office.

If any person has reason to think that they may have suffered damage to the eye as a result of laser exposure they MUST IMMEDIATELY seek medical attention. They should notify the LRO or other CLF staff and contact a local First Aider, call the Occupational Health Centre (ext 6666) or the ambulance (ext 2222) if the urgency of the situation demands it. The victim should be treated as for shock. The Oxford Eye Hospital is located at West Wing, The John Radcliffe Hospital, Headley Way, Headington, Oxford, OX3 9DU. The Eye Emergency Telephone number is 01865 234800. See http://www.oxfordeyehospital.nhs.uk/default.asp for further information.

Laser Responsible Officers (LRO's)

Overall Laser Responsible Officer: B Wyborn
Deputy: D Neely

Facility (Bldg.)	Area	LRO	Deputy
Vulcan R1	Laser Areas 1, 2 & 3	A Kidd	D Pepler
" "	Laser Area 4	A Kidd	D Pepler
" "	Front End Rooms	I Musgrave	W Shaikh
" "	Target Area West	M Notley	R Heathcote
" "	Target Area East	M Notley	R Heathcote
" "	Petawatt Target Area	M Notley	R Heathcote
" "	10PW seed source development lab	I Musgrave	W Shaikh
" R2	Interferometer Room	T Winstone	D Pepler
LSF R92	SORS	P Matousek	K Buckley
" "	Raman/AFM	P Burgos	S Botchway
" "	Loan Pool	I Clark	M Towrie
" "	ULTRA Laser 1 (G.44)	G Greetham	I Clark
" "	Tweezers (G.45)	A Ward	S Botchway
" "	ULTRA R&D Area (G.47)	I Clark	G Greetham
" "	ULTRA Laser 2 (G48)	G Greetham	I Clark
" "	ULTRA Raman Area (G49)	I Clark	G Greetham
" "	ULTRA IR Area (G.53)	I Clark	G Greetham
" "	Sample Area (G32)	S Webb	S Botchway
" "	Sample Area (G34)	S Webb	S Botchway
" "	Laser Area (G.36)	S Webb	S Botchway
" "	Sample Area (G37)	S Webb	S Botchway
" "	Raman Lab (G.60)	A Ward	M Pollard
Astra R7	Laser Areas 1 & 2	S Hawkes	C Hooker
" "	Gemini Laser Area 3	C Hooker	S Hawkes
" "	Artemis	E Turcu	E Springate
" "	Target Area 2	Dan Symes	P Foster
" "	Gemini Target Area 3	R Pattathil	P Foster

“	R1	Gemini Set-up Lab (5A)	D Symes	R Pattathil
R&D	R2	10 PW Front End	I Musgrave	M Galimberti
“	“	10 PW component facility	I Musgrave	M Galimberti
“	“	Vulcan HAPPIE	J Phillips	I Musgrave
“	“	Dipole Lab (G.11)	K Ertel	P Mason

8) ELECTRICAL SAFETY

There is inevitably electrical equipment in most areas of the CLF. These can be high voltage, high stored energy or high current electrical devices. They may well be in close proximity to cooling water or optical adjusters. Care must be taken at all times when working with electricity. Electrical shocks can kill or cause severe personal injury.

The safety rules for all electrical installations and apparatus at RAL are contained in the safety code RALSC3. The safety code RALSC8 and RAL Safety Information 62/2002 cover the safety of portable electrical equipment.

You MUST NOT work or attempt to work on any electrical apparatus without contacting the Authorised Person for the area containing the apparatus.

All high voltage apparatus must be registered with Safety Section if it exceeds the 5 mA/5 Joule rule (ref. 1.8, RALSC3).

Everyone using electrical apparatus must be aware of the shut-down procedures to render that apparatus safe.

Staff should ensure that all Portable Electrical Equipment is tested / inspected and that the correct label is attached prior to use and that is only used for the purpose for which it was intended and in the environment for which it was designed and constructed.
Schedule A portable electrical equipment is checked yearly, indicated by an appropriate sticker on the plug, cable or equipment. Schedule B equipment is checked every four years.
Any equipment with an out of date sticker should be withdrawn for testing. Any equipment not owned by the laboratory but available for use at the laboratory must be similarly checked prior to use at RAL (see STFC SHE Code 17).
Mark Pitts will be Liaison Officer to cover all facilities, laboratories and offices in the CLF.

Authorised Persons and deputies have been appointed for each area containing high voltage electrical apparatus and each area where low voltage apparatus is worked on. It is the job of the Authorised Person to ascertain that the person working on the apparatus is competent to do the work.

Electrical Authorised Persons

Electrical Authorising Officer P Holligan

Facility	Bldg	Area	Authorised person	Deputies
Vulcan	R1	Control Room	D Robinson	M Pitts
“	“	Laser areas 1, 2, 3 & 4	D Robinson	M Pitts
“	“	South Control Room	M Pitts	D Robinson
“	“	Target areas, East, West & Petawatt	M Pitts	D Robinson
“	“	Pulsed Power Room	M Pitts	D Robinson
“	“	Front End Rooms	D Robinson	M Pitts
“	“	TAP Plant Room	M Pitts	D Robinson
“	“	TAP Control Room	M Pitts	D Robinson
“	R2	Clean room	M Pitts	D Robinson
“	“	Amplifier & Flash Lamp test room	M Pitts	D Robinson
LSF	**R92**	SORS		M Pitts D Robinson
“	“	Laser Tweezers Development Lab		M Pitts D Robinson
“	“	Laser Loan Pool	M Pitts	D Robinson
“	“	Bio-Incubator		M Pitts D Robinson
“	“	SORS		M Pitts D Robinson
“	“	User Control Room (G.58)		M Pitts D Robinson
“	“	Nanoprobes & Ar+		M Pitts D Robinson
“	“	Raman/AFM		M Pitts D Robinson
“	“	Laser Office		M Pitts D Robinson
“	“	Bio Lab		M Pitts D Robinson
“	“	Chemical Lab		M Pitts D Robinson
“	“	Analytical		M Pitts D Robinson
“	“	ULTRA Laser 1 (G.44)		M Pitts D Robinson

"	"	Tweezers (G.45)		M Pitts	D Robinson
"	"	User Control Room (G.46)		M Pitts	D Robinson
"	"	ULTRA R&D Area (G.48)		M Pitts	D Robinson
"	"	ULTRA Laser 2 (G.48)		M Pitts	D Robinson
"	"	User Control Room (G.52)		M Pitts	D Robinson
"	"	ULTRA Raman Area (G.49)		M Pitts	D Robinson
"	"	ULTRA IR Area (G.53)		M Pitts	D Robinson
"	"	User Control Room (G.31)		M Pitts	D Robinson
"	"	Sample Area (G.32)		M Pitts	D Robinson
"	"	Sample Area (G.34)		M Pitts	D Robinson
"	"	User Control Room (G.35)		M Pitts	D Robinson
"	"	Laser Area		M Pitts	D Robinson
"	"	Sample Area (G.37)		M Pitts	D Robinson
"	"	User Control Room (G.38)		M Pitts	D Robinson
"	"	Target Prep. Area	M Pitts	D Robinson	
ESG	R1	Instrumentation Lab	M Pitts	D Robinson	
"	"	Dark Room	M Pitts	D Robinson	
"	"	Mechanical Workshop	M Pitts	D Robinson	
Eng.	R1	Electrical Workshop	M Pitts	D Robinson	
"	R7	Pulsed power room	M Pitts	D Robinson	
"	R2	Control room	D Robinson		M Pitts
Artemis	R7	Artemis	D Robinson		M Pitts
Astra	R7	Laser area			
"	"	Target area 2 & control room	D Robinson		M Pitts
"	"	Gemini Laser Area 3	D Robinson	M Pitts	
"	"	Gemini Target Area 3		M Pitts	D Robinson
"	"	Gemini Services Area	M Pitts	D Robinson	
"	R1	Gemini Set-up Lab (5A)	M Pitts	D Robinson	
R&D	**R2**	10 PW Front End	M Pitts	D Robinson	
"	"	10PW Component Test Facility	M Pitts	D Robinson	
"	"	Vulcan HAPPIE	M Pitts	D Robinson	
"	"	Dipole Lab	M Pitts	D Robinson	
"	"	Laser R&D Lab 1	M Pitts	D Robinson	
"	"	Laser R&D Lab 2	M Pitts	D Robinson	

9) CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (COSHH) SAFETY

A variety of hazardous substances such as chemical and biological materials are used throughout the CLF.

The RAL is subject to the COSHH Regulations (2002) regarding the use of substances for experiments as defined within HSN 51. Schedule 9 of the COSHH Regulations refers specifically to biological agents and The Genetically Modified Organisms (Contained Use) Regulations, 2000 are also applicable. The RAL safety regulations for biological safety are contained in Safety Code 16

Any person wishing to use a hazardous substance in the CLF may obtain advice from the nominated COSHH officer in charge of the area they are to work in. They must obtain authorisation before bringing any hazardous substance on site. A COSHH assessment must be carried out. Work involving bio-samples can only be carried out in designated biolabs and full training is required prior to the start of experiments within these areas. Initial contact must be with the area responsible person who will initiate the approval process. The completed bio-COSHH MUST be approved by the Biological Safety Officer (BSO) before commencing work with bio-samples and the process **requires 3 weeks to complete.**

In certain cases (in particular GMO experiments), site licence extension from the user institution may be required to cover RAL site or a new application may need to be made to the HSE for approval- this may take time.

At present the CLF restricts use of pathogens to Hazard Groups 1 & 2, as categorised by ACDP (4th Ed. 1995) HMSO booklet 'Categorisation of biological agents according to Hazard and categories of containment'. It should be noted that to work with certain biological agents the HSE must have 30 days prior notice. Further advice can be sought from the Biological Safety Officer.

If any person believes that they have suffered exposure to a hazardous substance they MUST IMMEDIATELY seek medical attention. The COSHH officer or another CLF member of staff should be notified and telephone the local First Aider, Occupational Health Centre (ext 6666) or the ambulance (ext 2222) if the urgency of the situation demands it.

COSHH & Bio-COSHH Officers

Overall COSHH Responsible Officer: A Parker
Deputy: I Clark

Facility	(Bldg)	Area	COSHH Officer	Deputy
Vulcan	R1	Laser Areas 1, 2, 3 & 4	A Kidd	D Pepler
"	"	Front End Rooms	I Musgrave	B Parry
"	"	South Control Room & Support Areas	M Notley	R Heathcote
"	"	Target Areas West	M Notley	R Heathcote
"	"	Target Areas East	M Notley	R Heathcote
"	"	Target Area Petawatt	M Notley	R Clarke
"	R2	Interferometer Room	T Winstone	A Frackiewicz
"	"	Clean Rooms	T Winstone	A Frackiewicz
"	"	Darkroom	D Pepler	T Winstone
LSF	R92	SORS Development Lab	A Parker	P Matousek
"	"	Laser Tweezers Development Lab	M Towrie	A Parker
"	"	Bio-Incubator	S Needham	S Roberts
"	"	Nanoprobes & Ar+	M Pollard	
"	"	SORS	P Matousek	
"	"	Raman/AFM	P Burgos	
"	"	Bio Lab	S Botchway	S Roberts
"	"	Chemical Lab	I Clark	B Coles
"	"	Analytical		
"	"	Loan Pool	I Clark	
"	"	ULTRA Laser 1 (G.44)	G Greetham	I Clark
"	"	Tweezers (G.45)	A Ward	
"	"	ULTRA R&D Area (G.47)	I Clark	G Greetham
"	"	ULTRA Laser 2 (G.48)	G Greetham	I Clark
"	"	ULTRA Raman Area (G.49)	I Clark	G Greetham
"	"	ULTRA IR Area (G.53)	G Greetham	I Clark
"	"	Sample Area (G.32)	S Webb	S Botchway
"	"	Sample Area (G.34)	S Webb	S Botchway
"	"	Laser Area	S Webb	S Botchway
"	"	Sample Area (G.37)	S Webb	S Botchway
"	"	User Control Room (G.38)	S Webb	S Botchway
"	"	Target Prep. Lab	M Tolley	C Spindloe
ESG	R1	Instrumentation Lab	M Notley	R Heathcote
Eng.	R1	Mech. Workshop and Cellar	B Landowski	
"	R2	Pulsed Power Area	M Pitts	P Holligan
"	R1	Mech. Assembly Area	A Frackiewicz	
"	R2	Elect. Workshop	M Pitts	
"	R7	Laser Area	C Hooker	
Artemis	R7	Artemis	I Turcu	
Astra	R7	Target Area 2	P Foster	D Symes
"	"	Target Area 2 Control Room	P Foster	
"	"	Gemini Laser Area 3	C Hooker	
"	"	Gemini Target Area 3	P Foster	D Symes
"	"	Gemini Target Area 3 Control Room	P Foster	
"	R1	Gemini Set-up Lab (5A)	D Symes	P Foster
"	"	AO Lab	C Hooker	B Parry
R&D	R2	10 PW Front End	I Musgrave	M Galimberti
"	"	Vulcan HAPPIE	J Phillips	I Musgrave
"	"	Dipole Lab	K Ertel	P Mason
"	"	Laser R&D Lab 1	C Hernandez-Gomez	
		Laser R&D Lab 2	C Hernandez-Gomez	

In the particular case of working with Beryllium the CLF has appointed Be Handling Officers as listed below. Only authorised people may work with Be.

Facility	(Bldg)	Be Handling Officer	Deputy
Vulcan	R1	M Notley	R Heathcote
Astra	R7	M Notley	R Heathcote

Bio-COSHH Officers
Biological Safety Officer: S Botchway
Deputy: A Parker

Note: Initial Contact must be made to the area responsible person to begin the approval process

Facility (Bldg)	Area	Bio-COSHH Area Contact	Deputy
LSF R92	SORS Development Lab	S Botchway	S Roberts
" "	Laser Tweezers Development Laboratory	S Botchway	S Roberts
" "	Bio-Incubator	S Roberts	S Needham
" "	SORS	P Matousek	A Parker
" "	Nanoprobes & Ar+	M Pollard	S Botchway
" "	Raman/AFM	P Burgos	
" "	Bio Lab	S Roberts	S Botchway
" "	Chemical Lab	B Coles	I Clark
" "	Analytical	S Botchway	S Roberts
" "	Loan Pool	I Clark	
" "	ULTRA Laser 1 (G.44)	G Greetham	
" "	Tweezers (G.45)	A Ward	
" "	ULTRA R&D Area (G.47)	G Greetham	I Clark
" "	ULTRA Laser 2 (G48)	I Clark	G Greetham
" "	ULTRA Raman Area (G49)	I Clark	G Greetham
" "	ULTRA IR Area (G.53)	I Clark	G Greetham
" "	Sample Area (G.32)	S Botchway	S Webb
" "	Sample Area (G.34)	S Botchway	S Webb
" "	Laser Area	S Botchway	S Webb
" "	Sample Area (G.37)	S Botchway	S Webb

10) IONISING RADIATION SAFETY

In the CLF radiation may arise in experiments involving radioactive sources (α, $\beta\pm$,γ radiation and neutrons) and high intensity laser-matter interactions (X-rays, neutrons and energetic charged particles) in target areas such as Vulcan TAP, Vulcan TAW & Astra TA2.

The CLF places a high importance on the control of this hazard and takes into account the type of radiation, its intensity and potential for exposure when devising control measures. Ionising radiation safety issues are dealt with in the RAL HSN20 and Safety Code 14 which must be complied with by all of the CLF's staff and visitors. All work involving exposure to ionising radiations or radioactive substances must comply with the requirements of The Ionising Radiation Regulations 1999. For the keeping, storage and disposal of radioactive substances the Laboratory is subject to The Radioactive Substances Act 1993 through specific Certificates of Registration and Authorisation. Other relevant regulations are: The High Activity Sealed Radioactive Sources and Orphan Sources Regulations 2005 (HASS Regulations), The Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR), The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007. Additional guidance on appropriate security measures for the storage of radioactive materials is also available through the NaCTSO publication "Security Arrangements for Radioactive Sources, October 2005."

Work involving ionising radiations must be supervised by a Radiation Protection Supervisor (RPS) appointed by the Director of the CLF. Radiation Protection Supervisors are appointed for each area and they are responsible for ensuring that all work in Controlled and Supervised areas is carried out in accordance with the Local Rules. The current RPSs are listed below. The site RPA can provide advice about prior risk assessments, Local Rules, transport and purchasing or loan of radioactive materials.

Work involving ionising radiations is subject to Local Rules which must be issued by the Director of the CLF before the work begins. They must be obeyed by all of the CLF's staff and visitors. Personnel who wish to work in areas covered by existing Local Rules must obtain the written approval of the appropriate RPS in advance. Personnel who wish to begin any new work involving ionising radiations must obtain the written approval either of the LSF Division Head (for work in the LSF) or the director of the CLF (for work elsewhere in the CLF) in advance. In particular no radioactive substance is to be brought to the CLF without prior written approval from one of these people. The Ionising Radiation Shielding Policy may also be applicable.

Radiation Protection Supervisors

Area	RPS	Deputy
Vulcan Target Areas, R1	R Clarke	R Heathcote
Astra Target Areas, R7	R Clarke	R Heathcote

11) SAFETY IN THE USE OF HAZARDOUS AND HIGH PRESSURE GASES

Quite often hazardous and high pressure gases are used in the operation of lasers, produced as a by-product or used in the experiments at the CLF such as Fluorine, HCl, Methane, Hydrogen and Ozone. Each gas has its own unique hazards and there may be the potential for the release of a lot of stored energy. Care must always be exercised when dealing with gases. It should be noted that even inert gases such as Nitrogen can cause asphyxiation when used in a confined space.

The RAL safety regulations for the use of toxic, flammable, hazardous and high pressure gases are contained in RALSC1, RALSC2, RALSC6, and HSN8 and for working in dangerous atmospheres and confined spaces in RALSC15. In addition the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) requires employers to assess the risks of fires and explosions that may be caused by dangerous substances in the workplace.

Systems involving the use of hazardous or high pressure gases must be installed, tested or modified only by competent persons under the supervision of authorised persons with the authorisation of the Nominated Engineer or deputy. Personnel who wish to begin any new work involving hazardous or high pressure gases must obtain approval in advance. Only pressure reducing valves registered by the CLF are to be used on equipment and can be obtained from or approved by the authorised persons.

Procedures to be taken in the event of a leakage must be included in the area's standing orders. These procedures must be followed by all of the CLF's staff and visitors.

Toxic, Flammable, Hazardous and High Pressure Gases Nominated Officers

Overall Nominated Engineer: B E Wyborn
Deputy S P Blake
P A Brummitt

Area	Authorised person	Deputy
N_2 system, R1, R2 & R7	B Landowski	A Frackiewicz
Vulcan experiment gases, R1	P Rice	D Neville
Target Prep Lab, R1	B Landowski	D Neville
Attosecond, Photo-Injector and 10 PW Labs, R2	B Landowski	A Frackiewicz
Adaptive Optics, R2	B Landowski	A Frackiewicz
Astra gas panels, R7	B Landowski	A Frackiewicz
Astra TA1 experiment gases, R7	S Hook	D Neville
Astra TA2 experiment gases, R7	D Neville	P Rice
Astra TA3 experiment gases, R7	D Neville	P Rice
LSF gas panels, R92	B Landowski	A Frackiewicz
LSF experiment gases, R92	B Landowski	A Frackiewicz

12) SAFETY IN RELATION TO MANUAL HANDLING AND USE OF LIFTING EQUIPMENT

There are many pieces of equipment which either because of their weight or bulkiness present a lifting hazard if handled incorrectly.

The Lifting Operations and Lifting Equipment Regulations (1998) is the relevant national regulation. The RAL safety regulations for manual handling and for the design, use and inspection of lifting equipment are contained in Safety Codes 4 and 12. Lifting equipment needs to be registered, used correctly, maintained and inspected regularly.

Personnel should not lift heavy loads such as surface tables without seeking advice from the Lifting Nominated Person (LNP). Any activity which involves the use of lifting equipment must be carried out only by competent persons authorised by the LNP, this includes the use of cranes, power operated fork lift trucks and mobile work platforms. A system of training, testing and issuing of operator licences is in place.

For some particular equipment authorised operators have been approved as shown below. In addition advice and assistance on manual handling tasks can also be supplied by the LNPs.

Lifting Nominated Persons

Overall Lifting Nominated Person: B Wyborn
Deputy S P Blake

Area	Lifting Nominated Person	Deputy	Specific Equipment	Authorised Operators
Vulcan Laser Areas R1	A Frackiewicz	B Landowski	Trolley Lift	T Winstone

			208 amplifiers	D Pepler A Frackiewicz A Kidd C Hernandez-Gomez B Landowski A Frackiewicz T Winstone
Vulcan Target Areas, R1	P Rice	D Neville		
Vulcan Pulsed Power Room, R1	P Holligan			
Vulcan TAP	D Neville	A Frackiewicz		Only specifically authorised persons are allowed to lift the compressor lids.
Pulsed Power Area, R2	B Landowski	A Frackiewicz		
Clean Rooms, R2	A Frackiewicz	B Landowski	208 amplifiers	B Landowski A Frackiewicz T Winstone
Mech. Workshop R1	B Landowski	A Frackiewicz		
Astra Laser, R7	B Landowski	A Frackiewicz		
Astra Target Areas, R7	D Neville	P Rice		
LSF, R92	B Landowski	A Frackiewicz		
R&D Labs, R2	B Landowski	A Frackiewicz		

13) SAFETY IN THE USE OF MACHINE TOOLS

Machine tools in use at the CLF include lathes, grinding or abrasive wheels, drilling and milling machines. The main hazards associated with these machines are contact with the moving workpiece or cutting device, from entanglement and from the waste material. Statutory obligations require that dangerous parts of the machines are securely guarded and that they are used safely.

Machine tools should only be operated by competent persons. CLF staff and visitors must get permission to use machines in the CLF workshops from B Landowski or A Frackiewicz.

14) SAFETY IN THE USE OF CRYOGENIC LIQUIDS

Cryogenic Liquids are often used within the CLF. In particular liquid Nitrogen is used for enhancing vacuum systems.

The RAL safety regulations for the handling and use of cryogenic liquids are contained in RALSC10.

Only those persons who have received suitable training may be permitted to handle or use cryogenic liquids. Before working with cryogenic liquids personnel must obtain authorisation from the relevant Area Safety Co-ordinator or deputy.

Dewars should be kept inside buildings where possible. This is important during cold, damp or wet weather conditions. The tops of dewars should be checked periodically to make sure they are free from ice and any gas venting paths are free from obstruction.

Suitable safety equipment must be worn when transferring any cryogenic liquids, because delicate tissues such as those of the eyes can be damaged by splashes from cold liquids or burns from cold surfaces. Advice on the use of cryogenic liquids can be supplied by the Health & Safety Group.

If any person believes that they have suffered a cold burn they MUST IMMEDIATELY seek medical attention. Contact a local First Aider, the Occupational Health Centre (ext 6666) or the ambulance (ext 2222) if the urgency of the situation demands it.

15) SAFETY WITH REGARD TO HOT WORKING

Whenever work takes place which uses naked flames or an alternative heat source, outside of a properly equipped workshop, a Hot Working Permit is required. Types of work include for example: welding, brazing, soldering and paint stripping (using blowlamps or hot air blowers).

The RAL safety requirements for such work are contained in RAL HSN60.

Whenever Hot Working is performed a competent person must be appointed who is responsible for doing a risk assessment and managing the Hot Working Permit if appropriate.

Further advice and information can be obtained from the SHE Group.

16) SAFETY IN USING DISPLAY SCREEN EQUIPMENT

More and more people are coming into contact with display screen equipment in their working lives.

The RAL HSN58 and the Health & Safety (Display Screen Equipment) Regulations 1992 deal with the subject. Computer users at RAL are defined as people who use a 'display screen' for more than 30 minutes on average more than three times a week. Regulations state that 'work stations', of which the screen is a part, must be assessed. This includes both the equipment and the environment.

If this applies to you then you should carry out a risk assessment of your workstation and send a copy of your assessment to A Ward who is the display screen assessor for the CLF.

17) SAFETY WITH REGARD TO APPARATUS LEFT WORKING UNATTENDED

Although it is generally discouraged, if it is necessary for apparatus to be left working unattended, the equipment must be made safe and a label indicating the shut down procedure and who to contact in an emergency must be displayed. Suitable labels can be obtained from the SHE Group.

18) SAFETY IN RELATION TO WORKING ALONE

Lone working is inherently more hazardous than normal procedures and should only be undertaken when there is no alternative and only then if it is safe to do so.

The RAL safety regulations for personnel working alone are given in HSN47.

In situations where significant hazards exist, personnel are not normally permitted to work alone. Before a lone working situation arises a full risk assessment must be made and a reasonably practicable safe system of work implemented.

There are no restrictions on working alone in the normal office environment.

19) SAFETY IN RELATION TO WORKING LONG HOURS

Working long hours can lead to tiredness and mistakes being made, potentially leading to accidents as well as possibly leading to work related illnesses. The ensuing risk will depend upon many factors- such as; the individual, the work, the hazards etc.

The Working Time Regulations 1998 and associated Directive have been introduced. The RAL policy is contained in CLRC Notice 2/1999.

Any hazardous activity is subject to a Risk Assessment which should, if relevant, take the possibility of personnel working long hours into account.

If personnel are likely to work more than 12 hours in a day then authorisation must be obtained from the relevant Group Leader.

20) SAFETY WITH REGARD TO YOUNG PERSONS

The Health and Safety of Young Persons Regulations 1997 places extra responsibilities on employers of young persons. These affect all persons under the age of 18 years and apply to casual work, short term work and work experience.

A risk assessment should be carried out before a young person (under the age of eighteen), starts work and, in the case of a "child" (under the age of sixteen), the child's parents must be given a copy of the assessment.

Any assessment carried out shall include the possible consequences of a lack of experience, absence of awareness of existing or potential risks, or that the young persons may not have fully matured.

Young persons shall not be employed for work which is:- beyond their physical capabilities, involves exposure to harmful or hazardous substances, or exposure to radiation or where there is a risk to health from noise, extreme heat or cold or vibration. Any young person employed should be supervised by a competent person and any risks reduced to the lowest level reasonably practicable.

21) SAFETY WITH REGARD TO ACCESS AND VACUUM OPERATIONS OF THE VULCAN TARGET AREA PETAWATT (TAP) INTERACTION AND COMPRESSION CHAMBERS

The TAP Interaction and Compression Chambers are on a large enough scale that there is the potential of persons entering the chambers. The risk of, either asphyxiation due to an oxygen deficiency in the chamber or the chamber being closed and vacuum operation started is now present. Special standing orders for the safe access and operation of the vacuum equipment have been put in place and all staff must obey these.

22) SAFETY WITH REGARD TO BUILDING ALTERATIONS

Plans for new buildings, for alterations to buildings and for change of use of buildings must be approved by the SHE Group in order to ensure that they conform to the appropriate regulations i.e. Fire Certificate etc. It is important that holes in fire separation walls are filled with fire-resistant material. Estates Operations and Maintenance or Building Projects Groups or SHE can offer advice.

Also because of the age of many of the buildings, there is quite a lot of asbestos-containing material (ACM) on site and it remains imperative that no building work is done without first evaluating the asbestos situation. This includes drilling holes in walls or lifting ceiling tiles, as well as more substantial works such as installing cables and pipes. All such work must be done in consultation with the Estates Operations and Maintenance or Building Projects Groups who will check the Asbestos Register and advise on any appropriate actions.

STFC SHE Code 19 'Work on Buildings, Premises, Services and Infrastructure' requires staff to not carry out building work, including minor work without approval from the relevant Estates Group or local Building Work Co-ordinator.

Normally only the Building Projects Group will manage building works. For the installation of CLF scientific equipment and its associated mechanical and electrical services, where the fabric of a building or its services needs to be disturbed, for example drilling holes through walls to provide access routes for services to experimental facilities, the following staff have been appointed as Building Work Co-ordinators: Brian Wyborn, Steve Blake, Paul Holligan, Mark Pitts, Brian Landowski, Darren Neville and Phil Rice.

In addition the Construction (Design and Management) (CDM) Regulations 2007 may apply to any demolition and building work. The RAL safety regulations for the CDM are contained in Safety Code 13. Building Projects Groups or SHE should be consulted and can offer advice.

23) SAFETY WITH REGARD TO CONTRACTORS

It is the policy of RAL to provide, as far as is reasonably practicable, healthy and safe working conditions for all who work at the laboratory whether or not they are employees of STFC, and to require that all these workers follow safe methods of working. This applies especially to contractors, service engineers etc.

The RAL safety regulations for the supervision of contractors are given in Safety Code 15.

When contracts are placed for work to be carried out on site at the CLF a member of CLF staff will be named as the contract Contract Supervising Officer.

Each Contract Supervising Officer or delegated deputy will:

a) ensure that the contractor and all of his staff are fully informed of all our safety procedures (e.g. for illness or injury at work; dangerous occurrences; fire; site emergency) and have attended a Health & Safety Induction talk.
b) ensure that the contractor is fully informed as necessary of our working procedures (e.g. electrical safety; portable electrical equipment; ladders, steps and trestles; scaffolds; lifting equipment; the use of cranes as working platforms; flammable gases and highly flammable liquids and liquefied petroleum gases; hot work; dangerous atmospheres and confined spaces; explosives) and has access to copies of the relevant RAL Safety Codes and Notices.
c) ensure that the contractor is aware of our general safety requirements (eg for fire prevention; the safety of visitors when personnel are required to work alone; the site speed limit and parking restrictions; signs, warnings and notices).
d) ensure that the contractor is aware of any special safety precautions which may be necessary in the area of work concerned and that liaison is established with the Area Co-ordinator of such areas (eg chemicals; lasers; or where the work is in a designated radiation area) to ensure that the rules for work in such areas are complied with.
e) ensure that the contractor is working safely, is not putting other personnel at risk and is not at risk from our activities.

24) SAFETY WITH REGARD TO NOISE

Exposure to excessive noise can damage hearing. The first aim should be to reduce, so far as is reasonable practicable the exposure of any worker to the noise.

The Control of Noise at Work Regulations 2005 (see STFC SHE Code 18) state that where any employee is likely to be exposed to noise at or above a first action level of 80dB(A) for daily exposure and 135dB (C) for peak noise, a noise assessment is to be carried out and a record of the assessment kept. Steps should be taken to eliminate or reduce the risk, staff should be made aware of the potential dangers and suitable and efficient ear protectors should be available on request for the employee. If any employee is likely to be exposed to noise at or above the second action level of 85dB(A) for daily exposure and 137dB (C) for peak noise, a noise assessment is to be carried out and a record of the assessment kept. The employee must be provided with suitable personal ear protectors and must wear them and must use any other protective measures provided. Ear Protection Zones should be established where an employee is likely to be exposed at or above the second action level of 85dB(A). These zones will be demarcated by Supervisors and identified by means of suitable notices (available from the SHE Group) which indicate the need for employees to wear personal ear protectors. Staff must not be exposed above a limit of 87dB(A) for daily exposure and 140dB (C) for peak noise.

For your guidance 80dB(A) is comparable to the noise levels in a busy street, crowded restaurant or a vacuum cleaner. At 85dB(A) you would typically have to shout to someone 2 metres away.

The SHE Group can carry out a noise assessment, provide the necessary records and give advice on measures that may enable hazardous levels to be reduced; they can also provide the ear protectors if these are advised.

A further hazard associated with noise is the possibility of being unable to hear warnings - bells, klaxon, shouts etc..
Whenever personnel are required to work in areas where the noise level or the wearing of ear protectors might prevent the wearer from hearing warning sounds, arrangements should be made for that person to be informed immediately an alarm is raised. Personnel should try to ensure that others are made aware of their entry to such an area.

25) SAFETY WITH REGARD TO NEW OR EXPECTANT MOTHERS

The Management of Health and Safety at Work Regulations 1992 (see Safety Notice 1 : 1998) requires that suitable and sufficient general and specific risk assessments are carried out with regard to pregnant women. These risks may be from exposure to physical, biological, radiological or chemical agents. The HSE have issued a booklet on how to carry out the relevant risk assessment. Copies are available from the SHE Group.

A new or expectant mother must notify her employer writing, that she is pregnant, has given birth in the previous six months, or is breast-feeding, in order that measures can be taken to avoid any risks to her health and safety.

Where possible her conditions or hours should then be altered to avoid any risk. Where this is not possible the employee should be suspended from such work for as long as necessary to avoid such risks.

26) SAFETY WITH REGARD TO WORKING AT HEIGHT

Falls from height result in a lot of injuries every year in the UK. The first aim should be to avoid working at height if possible.

The Work at Height Regulations 2005 require that before working at height, a competent person undertakes a risk assessment to establish whether the work can be avoided, or whether there is an existing safe place of work that could be used. If neither option is reasonably practicable, duty holders must then select suitable work at height equipment, giving priority to collective fall protection over personal fall protection measures.

The RAL safety regulations for Work at Height are given in Safety Code 9.

Where users have established that work at height cannot be avoided and that there is not an existing safe place of work, a ladder or mobile access tower might well be selected as the most suitable work at height equipment. The CLF possesses ladders and a mobile access tower and has workshop staff trained in the safe methods of ladder use and tower assembly, dismantling and alteration.

Where a mobile access tower has been selected for use staff should contact B Landowski for guidance and advice. On no account should untrained staff erect a mobile access tower themselves.

A permit to work may be required before working on a roof. Please contact Brian Landowski for guidance and advice.

27) SAFETY WITH REGARD TO TRAVEL

Travel, specifically by car, is a major cause of work related fatalities in the UK.

The unpredictability of driving conditions makes establishing absolute guidelines for safe driving times difficult. Such guidelines must be implemented pragmatically and depend most critically on the driver's awareness and alertness for the driving and journey undertaken. The following guidelines should provide the basis of journey planning for drivers:

Maximum driving period 2.5 hours, to be followed by a 15 minute break/stop;
Maximum continuous driving time, including breaks/stops, should not exceed 9 hours;
A working day followed by business driving should not exceed 12 hours;

Where overseas travel is planned to potentially hazardous destinations staff should consult the Foreign and Commonwealth Office (FCO) web site for advice.

The RAL safety regulations for Travel on Council Business are given in Safety Code 8.

28) SAFETY WITH REGARD TO LOCAL EXHAUST VENTILATION SYSTEMS (LEV)

After considering elimination and substitution as methods of prevent exposure to hazardous fumes and dust, local exhaust ventilation (LEV) is widely applicable for controlling dust and fumes.

Any LEV system needs to be appropriately designed, installed and commissioned before being brought into use The system should be proved to be capable of meeting its design specification. Appropriate details of airflow velocities and pressures should be recorded to provide standard performance data for future reference.

Once installed, the LEV should be regularly checked for leaks or blockages and maintained according to the manufacturer's instructions. The LEV must be thoroughly examined and tested at least once every 14 months by a competent person.

29) SAFETY WITH REGARD TO WORK IN CONFINED SPACES

Work in confined spaces (including people who try to rescue trapped personnel without proper training and equipment) can be dangerous and should be avoided where possible. Where this is not possible a written suitable and sufficient risk assessment must be undertaken and a safe system of work developed.

The RAL safety regulations for Work in Confined Spaces are given in Safety Code 11.

APPENDIX 1 - LIST OF LEGISLATION, CODES, NOTICES AND STANDARDS ETC.

There is a wide, and constantly being updated, range of legislation for Health and Safety. To comply with these the laboratory has issued a number of codes and notices. In addition other standards should be observed where appropriate. A list of legislation, codes, notices and standards that are considered appropriate is shown below, together with any associated Regulations, Approved Codes of Practice and Guidance Notes. Cases outside the scope of these must be given individual attention necessary to ensure comparable standards.

SAFETY LEGISLATION

The Health and Safety at Work etc. Act 1974
The Management of Health and Safety at Work Regulations 1999
The Manual Handling Operations Regulations 1992
The Lifting Operations and Lifting Equipment Regulations 1998
The Health and Safety (Display Screen Equipment) Regulations 1992
The Provision and Use of Work Equipment Regulations 1998
The Workplace (Health Safety & Welfare) Regulations 1992, amended 2002
The Personal Protective Equipment at Work Regulations 1992
The Control of Substances Hazardous to Health Regulations 2002
The Electricity at Work Regulations 1989
The Radioactive Substances Act 1993
The Ionising Radiation Regulations 1999
The Health and Safety of Young Persons Regulations 1997
The Reporting of Injuries Diseases and Dangerous Occurrences Regulations 1995
The Working Time Regulations 1998
The Confined Spaces Regulations 1997
The Noise at Work Regulations 1989
The Construction (Design and Management) Regulations 2007
The Highly Flammable Liquids and Liquefied Gases Regulations 1972
The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)

STFC SAFETY POLICY STATEMENT

RAL SAFETY CODES

RALSC 3 - Electrical Safety
RALSC 4 - Batteries
RALSC 5 - Safety in the Construction and Use of Scaffolds
RALSC 7 - Repair of Drums and Small Tanks - Explosion and Fire Risks
RALSC 9 - Ladders, Steps and Trestles

RAL HEALTH AND SAFETY NOTICES

No.60 - Hot Working Permits
No.59 - Personal Protective Equipment and Work Regulations 1992
No.58 - Health and Safety (Display Screen Equipment) Regulations 1992
No.51 - The Control of Substances Hazardous to Health Regulations 1994
No.48 - RAL Safety Code No.7 - Repair of Drums and Small Tanks Explosion and Fire Risks
No.47 - Personnel Working Alone
No.41 - Safety of Visitors
No.40 - Audible Alarms
No.37 - Eyebolts
No.36 - Building Wardens
No.35 - Site Emergency
No.34 - Safety Signs, Symbols and Colours
No.33 - Use of Liquefied Petroleum Gas Cylinders
No.30 - Procedure in the Event of Fire
No.29 - Fire Prevention
No.28 - Contract Superintending Officers' Responsibilities Regarding Safety
No.22 - RAL Safety Code No.4 - Batteries
No.21 - Radiation Protection Adviser
No.20 - Protecting Against Ionising Radiation
No.19 - Mercury
No.16 - The Use and Storage of Explosives
No.15 - Abrasive Wheels
No.14 - Colour of Hoses for Gases
No.13 - Glove Boxes, Shielded Process Enclosures and Fume Cupboards
No.12 - The Highly Flammable Liquids and Liquified Petroleum Gases Regulations 1972

No.11 - Safety Interlocks
No.10 - Safety Footwear
No.9 - The Biological Effects of Magnetic Fields
No.8 - New Regulations of Pressure Systems and Transportable Gas Containers (Updated June 2009)
No.5 - Breathing Apparatus
No.3 - Apparatus Left Working - Emergency Instructions

CORPORATE SAFETY NOTICES

No 57 - Revision of RAL Safety Notice 8
No 56 - Revision of SHE Code 17, PAT Code
No 53 - Update to SHE Training Code 10
No 51 - Audit and Inspection (Safety Code 30)
No 47 - Health Surveillance (Safety Code 24)
No 46 - Management of Strong EMFs (Safety Code 23)
No 45 - STFC Safety Code Updates
No 44 - Management of Radioactive Waste
No 43 - Working with Lasers (Safety Code 22)
No 40 - Controlling Explosive and Flammable Gases and Dusts
No 39 - STFC Safety Policy
No 37 - Work on Buildings (Safety Code 19)
No 34 - Travel Code Update
No 33 - Vehicle Incidents
No 30 - Noise at Work (Safety Code 18)
No 29 - Portable Electrical Equipment (Safety Code 17)
No 25 - Management of Biological Safety (Safety Code 16)
No 24 - Control of Contractors (Safety Code 15)
No 23 - Radioactive Sealed Sources (Safety Code 14)
No 22 - CDM (Safety Code 13)
No: 21 - Serious or Potentially Serious Incidents
No 17 - Manual Handling (Safety Code 12)
No 16 - Work in Confined Spaces (Safety Code 11)
No 15 - Work at Height (Safety Code 9)
No 14 - Sharing Learning from Health, Safety and Environment Incidents
No 13 - Risk Management - Quantitative Risk Assessment
No 12 - Provision of Safety, Health and Environment Training
No 11 - Travel on Council Business (Safety Code 8)
No. 10 - SHE Improvement Planning (CCLRC Safety Code 7)
No. 9 - Risk Management (CCLRC Safety Code 6)
No. 8 - Incident Reporting and Investigation (CCLRC Safety Code 5)
No.7 - Safety Management
No. 6 - The Work at Heights Regulations 2005
No:5 - The Control of Noise at Work Regulations 2005
No 4 - Laser Safety
No 3 - The Control Of Substances Hazardous To Health Regulations 1994
No.2 - CCLRC Safety Code 1 - Laser Safety
No.1 - The Management of Health and Safety at Work Regulations 1992

CORPORATE SAFETY CODES

SC2 - Safety In The Handling And Use Of Cryogenic LiquidsSC4 - Lifting Equipment
SC5 - Incident Reporting & Investigation
SC6 - Risk Management
SC7 - SHE Improvement PlanningSC8 - Travel on Council Business
SC9 - Working at Height
SC10 - Provision of Safety, Health and Environmental (SHE) Training
SC11 - Work in Confined Spaces
SC12 - Manual Handling
SC13 - Construction (Design and Management)
SC14 - Radioactive Sealed Sources
SC15 - Management of Contractors
SC16 - Biological Safety
SC17 - Portable Electrical Equipment
SC18 - Control of Noise at Work
SC19 - Work on Buildings, premesis, services and infrastructure
SC20 - Controlling Explosive and Flammable Gases and Dusts
SC21 - Management of Radioactive Waste

SC22 - Working with Lasers
SC23 - Managing Risks from strong time-varying electro-magnetic fields
SC24 - Occupational Health Surveillance and Health Screening Medicals
SC30 - SHE Auditing and Inspection

CORPORATE Policies

Ionising Radiation Shielding Policy
Environmental Policy

OTHER RELEVANT CODES

Fire Precautions Act 1971, Fire Precautions (Workplace) Regulations 1997
Fire Certificate (Special Premises) Regulations 1976
British Standard Specifications
The Institution of Electrical Engineers Wiring Regulations for Electrical Installations
Recommendations of the Fire Protection Association
HSC Approved Codes of Practice
HSE Guidance Notes

APPENDIX 2 – CLF Incident/Emergency Response Plan

This appendix describes the proposed management structure for dealing with a RAL incident/emergency in the CLF. These procedures would come into effect when a localised departmental incident is or has the potential of affecting an area greater than the building or the immediate vicinity and/or could necessitate the evacuation or controlled access of the whole or part of the RAL Site The primary aim of this plan is to safeguard the life of everybody on the RAL site and surrounding area. This will be achieved by ensuring any incident is brought as quickly and smoothly as possible under control by implementing the RAL Incident/Emergency Response Plan.
The Emergency Team comprises people who have specific roles in dealing with a emergency. In particular there is a role for a Local Incident Controller whose role is to take control of the incident at the scene, make short term decisions concerning the actions required to control the cause of any incident or emergency and to act on the directions of the RAL Emergency Controller. These officers are Area Supervisors or experts/specialists for critical hazards in their areas. A site maintenance or plant engineer will act as the local incident controller during silent hours until the Area Supervisor takes control.

The following have been identified as Local Incident Controllers for the CLF:

Area	**Local Incident Controller**
Vulcan	I Musgrave
Target Areas	R Clarke
LSF	D Clarke
Astra	R Pattathil
Engineering	B Wyborn

In addition the following key support personnel have been identified:

Utility	**Key Support personnel**
IT/Network	N Fielden
Electrical	M Pitts
HVAC	B Landowski
Misc. Utilities	B Landowski