

LOCAL RULES FOR R80 EXPERIMENTAL HALL

These Local Rules are a requirement of the Ionising Radiations Regulations 1999. They apply to all persons working within the specified area. Documents referred to in the text form part of the Local Rules and may refer to other regulations.

It is a requirement for any work in this area that these Local Rules have been read, understood and acknowledged (by signature) prior to access.

Operations not covered within these local rules must have a specific method statement and prior risk assessment for those operations completed and authorised by the RPS, in consultation with the RPA, before any action can proceed.

Responsible Author: Area Supervisor E Johnson		Date
Advised by: P Wright , RPA		Date
RPS: I/We are responsible for ensuring work in this area is carried out in full compliance with these Local Rules. E Johnson		Date

I fully endorse and approve these Local Rules; they must be followed by all STFC personnel, Users, visitors and contractors whilst working in the R80 Experimental Hall Controlled and Supervised areas.

Approved by: Division Head		Date
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Revision History

Version	Date	Section	Comments
1	07/12	All	Convert to new template from LR/35
2	02/14	3, 4	Addition of LARMOR beamline
3	05/14	3, 4	Addition of CHIPIR beamline (pre-reflector change)
4	05/16	3, 4	Area supervisor and RPS changed. Addition of IMAT beamline. Review and update of remaining document.
N/A	11/16		Review of document – no changes made
5	04/17	2, 3, 4	R80 area updated. Deputy RPS changed. SANS2D and ZOOM beamlines added/updated

These Local Rules must be reviewed, and appropriately amended before:- **June 2017**

LOCAL RULES FOR R80 Experimental Hall

1. Introduction

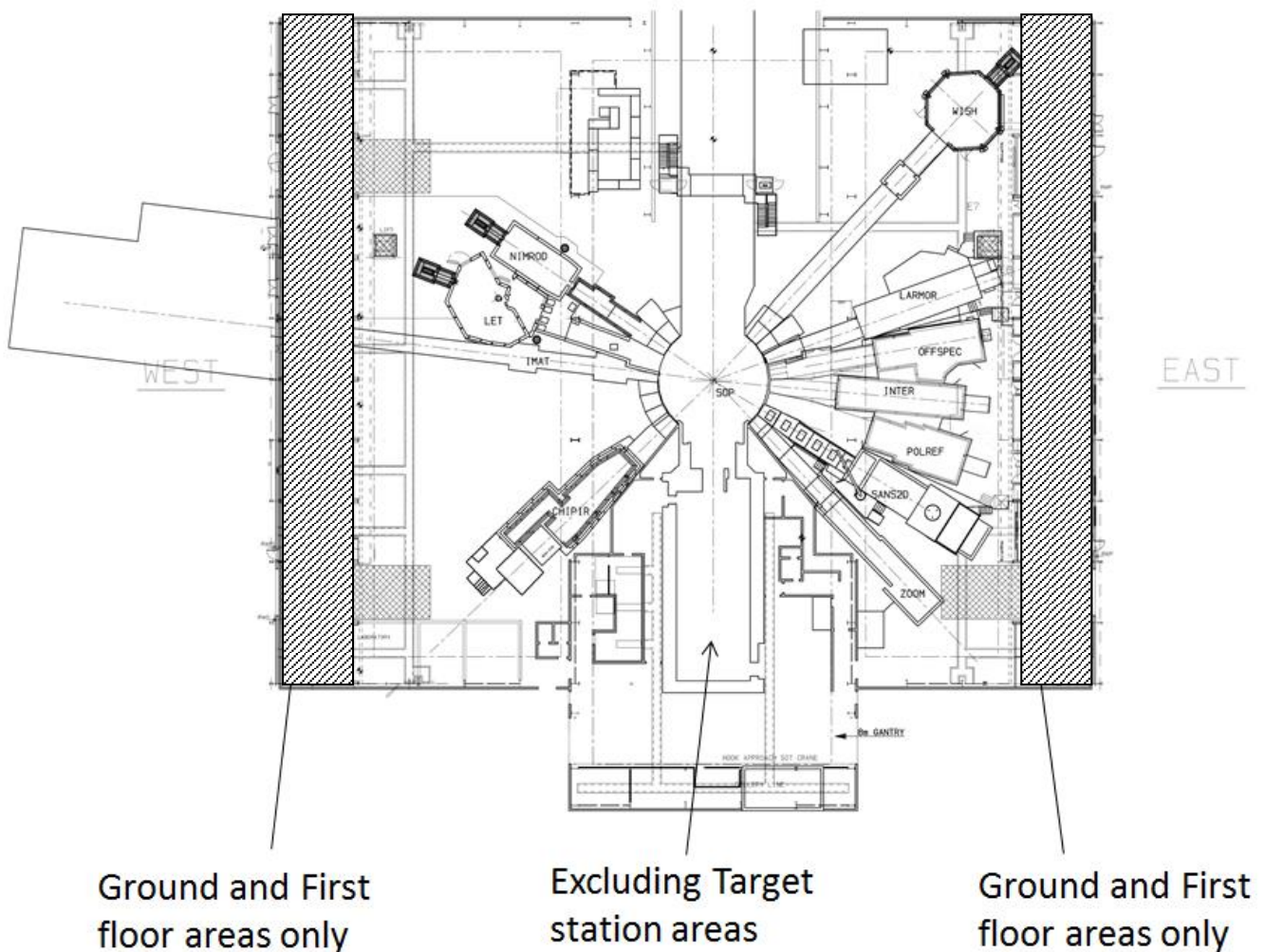
These local rules are a requirement of the Ionising Radiations Regulations 1999. They apply to all persons working within the specified area.

Operations not covered within these local rules must have a method statement and prior risk assessment completed and authorised by the RPS, in consultation with the RPA, before any action can proceed.

2. Description of Area and Radiological Designation

These Local Rules cover the main hall of R80, **excluding** the Radiochemical Lab in the building's north east corner, EPB2, the Target services areas, manipulator rooms, remote handling cell and tunnels. The upper floor offices and plant rooms are also excluded as these areas are not designated.

See Fig 1 below. The area is that covered by these Local Rules and is designated a **Controlled** area.



3. Responsibilities and Contact Details

RPS	Erik Johnson	07900 136963
Deputy RPS:	Rebecca Riehl Shaw	07525 313839
RPS (Sample Preparation)	Marek Jura	07775 821363
RPA Paul Wright,	Bld R12 Rm G002	Extn: 5480
ISIS Health Physics		Extn: 6696
ISIS Duty Officer	Bld 5.1 MCR	Extn: 6789

Each instrument is operated by an Instrument Scientist and every experiment has a designated local contact, responsible for the preparation of the experiment, running the experiment and clearing up afterwards. Responsible Science Group Leaders are:

John Webster	07740 760359	POLREF, INTER, OFFSPEC, LARMOR, SANS2D, ZOOM
Daniel Bowron	01235 446397	NIMROD
Steve Hull	01235 446628	IMAT, WISH,
Ross Stewart	07557 012585	LET
Chris Frost	07798 535255	CHIPIR

4. Radiological Hazards

For LARMOR, INTER, IMAT, POLREF, OFFSPEC and CHIPIR Instruments

An intense collimated neutron beam is admitted through the front-end beam line into the blockhouse by opening the beam line shutter, situated inside the target monolith. In the case of CHIPIR, there is also a beam blocker in the front of the blockhouse, which automatically opens after the shutter.

Radiation levels in the beam are expected to be hundreds of mSv/h. With the shutter closed, radiation levels are expected to be tens of μ Sv/h.

For LET, NIMROD and WISH Instruments

The neutron beam enters a vacuum tank located inside the blockhouse when the beam line shutter is opened. The sample position is in the vacuum tank.

Radiation levels in the beam are again expected to be hundreds of mSv/h and with the shutter closed, tens of μ Sv/h.

For SANS2D and ZOOM Instruments

The neutron beam enters a vacuum tank located inside the blockhouse when the beam line shutter is opened. The sample position is immediately upstream of the vacuum tank. Radiation levels in the beam are expected to be hundreds of mSv/h and with the shutter closed, tens of μ Sv/h.

Active samples:

Material placed in any neutron beam may become activated. All material which may have been affected in this way must be handled according to ISIS/SI16. Some samples may have been activated prior to arrival at ISIS or may be naturally radioactive. All such materials must be managed according to Experimental Operating Instructions (EOI1 and EOI3). While most samples are not active, some can be of the order of tens of μ Sv/h.

Neutron Sources:

Neutron sources may be used on instruments or other areas of the Experimental Hall. Each source is subject to its own risk assessment, local procedures and signage and must be secure at all times and have its movements logged promptly and accurately using the Isostock database. Radiation levels exhibited by these sources will generally be less than 1 μ Sv/h in the working area.

For all other areas

Radiation from the monolith has been shielded to the extent that working with completed shielding is non-hazardous (largely <1 μ Sv/hr, although some areas very close to the monolith show levels of around 5 μ Sv/h). Removal of shielding could expose radiation in the area of the shield wall and the beamlines when the ISIS accelerator is running beam to TS2. The expected levels are tens of μ Sv/h.

Operational risks assessments have been completed for all experiment and experiment support work on the beam lines. These are available on the ISIS Health and Safety document store and in the Experimental Risk Assessment SharePoint area.

<http://www.facilities.rl.ac.uk/isis/safety/default.aspx>

<http://www.facilities.rl.ac.uk/isis/experiments/PDFExperimentRiskAssessments/Forms/ByInstrument.aspx>

5. Safe Systems of Work and Methods of Protection

5.1 Procedures for Restricting Access to the Area

Access to R80 is a card swipe system with all staff and users receiving training and successfully completing a test before being allowed to work in the building. A mechanical and electrical interlock system prevents access to the beam lines while beam is being admitted and will shut ISIS accelerator down if challenged. A blockhouse search procedure must be carried out before the beam line is closed up, ready for beam to be admitted. Failure to complete the search prevents the shutter from being opened.

5.2 Working Procedures

1. All work in R80 must be carried out *either* by classified radiation workers *or* by people working under a system of work, which includes a specific Risk Assessment and Method Statement, wearing personal dosimetry.
2. All radiation warning signs *must* be complied with.
3. No alterations may be made to any locking or interlock systems controlling personnel access to radiation areas without *explicit* authorisation from the ISIS Safety Modification Panel.
4. No radiation shielding blocks (steel, concrete or wax tanks) may be removed without *explicit* authorisation from the ISIS Safety Modification Panel. See OPI201.
5. No services (electrical, water, compressed air, gases, etc.) may be worked on without *explicit* authorisation from Instrument Operation Group management with Health Physics support as necessary.
6. No alterations may be made to radioactive gas extraction systems without *explicit* authorisation from Health Physics management and the advice of the RPA.

7. Any accidental damage to shielding or accidental movement of shielding *must be reported immediately* to the Main Control Room (MCR) and the RPS.
8. Sample handling information can be found in ISIS/EOI1.
9. Any beam-line components or materials exposed to the neutron beam will be treated according to ISIS/SI16.
10. Women working with ionising radiation hazards should be aware of the importance of informing their Division Head, Group Leader or Local Contact of pregnancy as soon as possible. On being informed by an expectant mother a “New or expectant mother” SHE Risk Assessment, with a radiological risk assessment component, must be carried out by the supervisor of the expectant mother with the advice of the RPA.
11. Special arrangements exist for visitors and these must be adhered to at all times.
http://www.facilities.rl.ac.uk/isis/safety/instructions/SI_19_Visits%20to%20Controlled%20Areas.doc
12. Special arrangement exist for under-16’s, trainees and Work Experience students and these must be adhered to at all times.
http://www.stfc.ac.uk/SHE/resources/secure/pdf/SC29_Appendix12.pdf
13. The use of any sealed source is governed by specific Risk Assessment and Method Statement pertinent to the use of a particular source at that time.
14. Safeguarded materials (containing uranium, thorium or plutonium) are subject to stringent accountancy requirements and their receipt on site and use is subject to strict procedural control. Such work must be discussed with the RPS and RPA ahead of the arrival of any safeguarded material to site.

5.3 Methods of Protection

Nothing required. However, additional requirements may be specified by the Permit to Work for certain jobs.

5.4 Signs

Radiation warning signs showing the area designation must be displayed at the entrances to the area. Personnel entering the area must comply with any instructions specified.

5.5 Safety Alarms

For beamlines only

An alarm sounds while the search procedure is in progress. On hearing this alarm, anyone inside the blockhouse must leave. An alarm test forms part of the interlock functionality safety checks. Red ‘Beam On’ lights are illuminated and blue area lighting is automatically switched on whenever a beam line shutter is opened and beam could be admitted to the searched and locked beamline.

5.6 Personal Dosimetry

Anyone entering the Controlled area is assigned personal dosimetry provided by the RAL Dosimetry Service, as advised by the RPA.

5.7 Monitoring Arrangements

Any material that may have been exposed to the neutron beam must be monitored and dealt with according to ISIS/SI16. Any sample with a contact dose rate $>75\mu\text{Sv/h}$ subject to special handling procedures. Unexpected radiation detected in the beam line will cause the interlock system to switch the ISIS accelerator off.

5.8 Dose Investigation and Action Levels

The dose investigation level for classified persons in all areas within ISIS is 3mSv, and for non-classified persons, 1 mSv. Operational limits which have been chosen to keep doses as low as reasonably practicable are given in SHE Code 29. Any dose which exceeds these operational limits must be reported immediately to line management and the site RPA by the RPS, Area Supervisor or Health Physics.

6. Accounting for and Security of Radioactive Material

All radioactive material must be treated in accordance with ISIS/SI16. Nuclear materials are subject to Safeguard accounting and reporting. STFC SHE Codes 14, 28 and 29 cover the use of radioactive material and the management of ionising radiation at work. SHE Code 21 covers the management of radioactive waste.

7. Accident Scenarios and Contingency Plans

For all beamlines

Radiation is expected to be contained within the beam line and blockhouse structure. A search procedure and personnel interlocks should prevent personnel exposure. The blockhouse personnel interlock system includes emergency beam-off-buttons and emergency break-out through the door. Residual radiation risks are low for all other areas covered by these local rules.

In the event of exposure or possible exposure to the neutron beam (person present in an interlocked area with blue lights on and interlock system **not** in a failsafe fault condition), the incident must be reported to the ISIS Duty Officer, the RPS and the RPA **immediately**. The RPS is responsible for instigating an investigation.

ISIS/EOI1 includes plans for handling sample contamination. OPI305 covers the contingency plans for accidental radiation exposures.

7.1 Action in the event of Fire

If you discover a fire:

Shout to alert persons nearby.

Break glass alarm

Secure any radioactive material if it is safe to do so.

Leave the area by the nearest exit and go the Fire Assembly Area

Dial RAL Site Security on 2222 (01235 778888 from a mobile)

Give location of fire.

Inform the ISIS Duty officer (Ext 6789) of the Fire and the presence of any radioactive material in the area.

If you hear the fire alarm:

Secure any radioactive material if it is safe to do so.

Leave the area by the nearest exit and go to the Fire Assembly Area

Inform the ISIS Duty Officer (Ext 6789) of the presence of radioactive material

7.2 Loss or Damage to Radioactive Materials

In the event of loss, theft or damage to any radioactive materials, inform the RPS, RPA and the ISIS Duty Officer immediately. If there is any possibility of contamination then evacuate and secure the area – report this to the Duty Officer who will contact ISIS Health Physics and the RPA.

Assemble safely nearby so as to minimise the spread of contamination, and await help from ISIS Health Physics and advice from the RPA.

7.3 Damage or Reduction of Radiation Shielding, Containment or Interlocks

In the event of any damage or reduction to any radiation shielding, containment or interlocks, close the shutter and report the incident to the RPS and RPA and the ISIS Duty Officer immediately. If there is any possibility of radiation exposure or contamination then evacuate and secure the area - report this to the Duty Officer who will contact ISIS Health Physics and the RPA. Assemble safely nearby so as to minimise the spread of any contamination, and await help from ISIS Health Physics.

7.4 Injury with Potential for Contamination

In the event of injury to personnel with the possibility of contamination, call 2222 to obtain trained assistance to deal with the injury. Also call the ISIS Duty Officer – they will call for Health Physics support to deal with the contamination – and notify the RPS and the RPA.

7.5 Reporting Arrangements

All accidents and near misses should be reported using SHE Enterprise, all incidents involving radiation should be reported as soon as possible to the RPS who is responsible for informing the RPA and recording the information in SHE Enterprise.

8. Documentation

A copy of these rules must be displayed at the main entrance to the area.

Hardcopies are also available at the ISIS Main Control Room.

An electronic version will be stored on the ISIS Health and Safety SharePoint area under ‘Local Rules’ <http://www.facilities.rl.ac.uk/isis/safety/localrules/Forms/AllItems.aspx>

A Risk Assessment applicable to support work and experimental use must be clearly displayed in the work area.