

Rutherford Appleton Laboratory
Ionising Radiations Regulations 1999

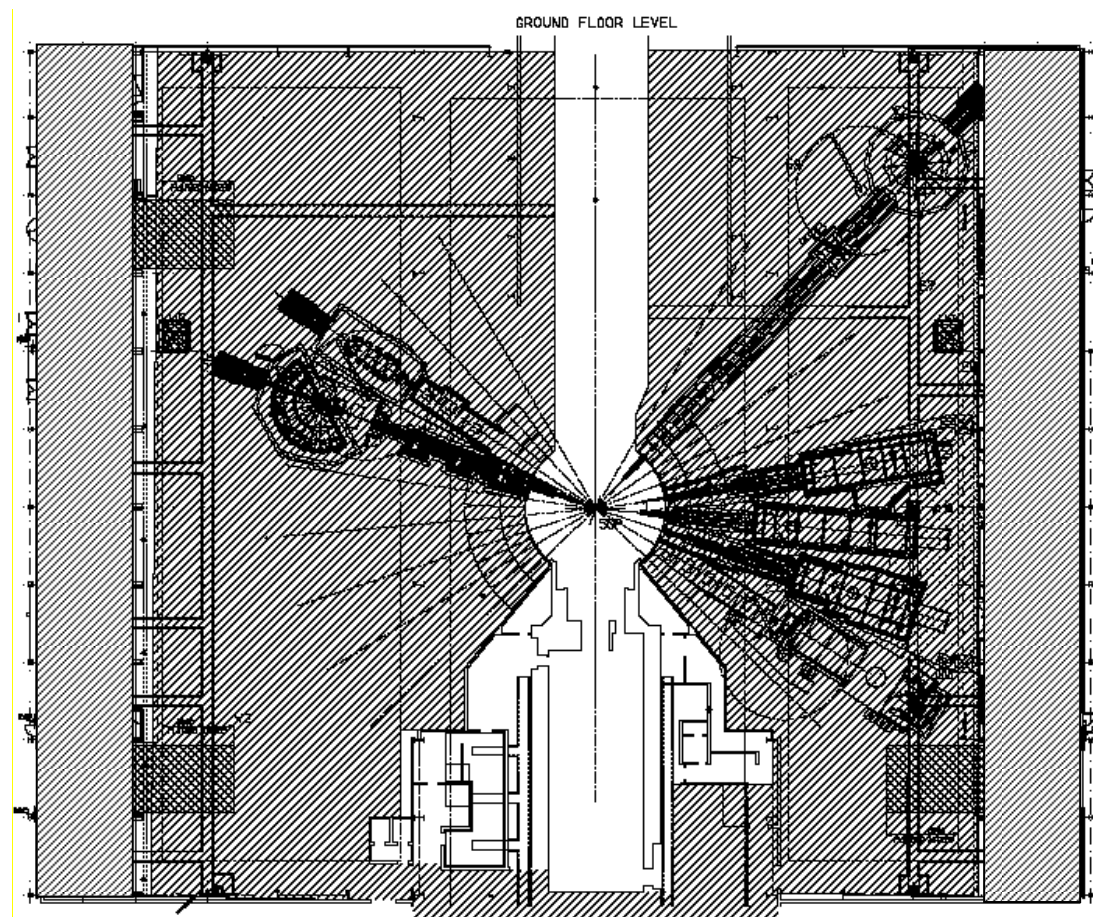
LOCAL RULES FOR R80 EXPERIMENTAL HALL

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 prior risk assessment completed and authorised by the RPS in consultation with the RPA before any action can proceed. These Local Rules are for a limited period of commissioning only. They must be reviewed and updated as each new instrument is cleared to take beam.

2. Description of Area

These Local Rules cover the main hall area of R80, they exclude EPB2, the Target Services Area, manipulator rooms, remote handling cell and tunnels as well as the upper floor office and plant areas, which are undesignated.



3. Responsibilities and Contact Details

RPS: **Steve Wakefield** (07770 858075)

John Webster (07740 760359) for INTER samples, sample environment equipment and detector changes only.

Tim Charlton (07880 785244) for POLREF samples, sample environment equipment and detector changes only.

Rob Dalglish (07753 975472) for OFFSPEC samples, sample environment equipment and detector changes only.

Daniel Bowron (ext. 6397) for NIMROD samples, sample environment equipment and detector changes only.

Pascal Manuel (07833 965011) for WISH samples, sample environment equipment and detector changes only.

Richard Heenan (07764 212155) for SANS2D samples, sample environment equipment and detector changes only.

Rob Bewley (07901 853484) for LET samples, sample environment equipment and detector changes only.

SANS2D, INTER, POLREF and OFFSPEC Science Group Leader: **Sean Langridge** (07990 506709)

NIMROD Science Group Leader: **Alan Soper** (ext. 6487)

WISH Science Group Leader: **Laurent Chapon** (07786 747383)

LET Science Group Leader: **Steve Bennington** (07799 092649)

ISIS Duty Officer (ext. 6789)

4. Radiological Classification

The office area is undesignated.

All areas in the experimental hall ground floor are **Controlled**.

5. Radiological Hazards

For Inter, Polref and Offspec Instruments

An intense collimated neutron beam is admitted through the front-end beamline into the blockhouse by opening the beam line shutter, situated inside the target monolith. 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 Instrument

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 $\mu\text{Sv/h}$.

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.

West side Chemistry Lab annex

A Panalytical X-ray diffractometer will be operated from w/c 016/02/09. A separate set of local rules has been written to cover experimental commissioning. Risk from ionizing X-ray radiation has been assessed by the equipment supplier, Panalytical, as “negligible”.

For all other areas

The shutters of all other instruments will be closed. Radiation from the monolith has been shielded to the extent that working with completed shielding is non-hazardous ($<1\mu\text{Sv/hr}$). 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 $\mu\text{Sv/h}$.

6. Signs

A copy of the local rules will be posted at the entrance to R80 foyer and in the Alstec office.

Signs indicating the Controlled designation of the experimental hall area will be posted at all doors leading to it.

A copy of these Local Rules and a list of personnel authorised to work in each blockhouse will be displayed on each beamline. Radiation signs indicating the “Controlled” designation and radiation levels must be displayed at all entrances to interlocked areas.

7. Procedures for Restricting Access

Access to R80 will be a card swipe system will all staff receiving an induction before working in the building.

Access to the beamline and blockhouse is restricted to classified persons and persons operating under a Safe System of Work. A mechanical and electrical interlock system prevents access to the beamline 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. R80 is subject to access control.

8. 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.

9. Personal Dosimetry

Standard RAL dosimetry requirements apply (RAL/HSN20).

10. Methods of Protection

None required for radiological protection.

11. Radiation and Contamination Monitoring

Any material that may have been exposed to the neutron beam must be monitored and dealt with according to ISIS/SI16. Unexpected radiation detected in the beam line will cause the interlock system to switch the ISIS accelerator off.

12. Dose Investigation Level

The dose investigation level for all areas within ISIS is specified in RAL/HSN20.

13. Accounting for Radioactive Material

All radioactive material must be treated in accordance with ISIS/SI16.

14. Detailed Working Arrangements

1. All work in R80 must be carried out *either* by classified radiation workers *or* by people working under a permit-to-work system wearing OSL badges.
2. All radiation warning signs *must* be complied with.
3. No alterations may be made to any locking systems controlling personnel access to radiation areas without *explicit* authorisation. Refer to OPIs.
4. No alterations may be made to any interlock systems covering radiation areas without *explicit* authorisation from the ISIS Safety Modifications Panel.
5. No radiation shielding blocks (steel, concrete or wax tanks) may be removed without *explicit* authorisation. See OPI201.
6. No services (electrical, water, compressed air, gases, etc.) may be worked on without *explicit* authorisation from BNS Ltd management with Health Physics cover.
7. No alterations may be made to radioactive gas extraction systems without *explicit* authorisation from Health Physics management

8. Any accidental damage to shielding or accidental movement of shielding *must* be reported *immediately* to the Main Control Room (MCR), Les Clifford, Steve Wakefield and Paul Wright.
9. Any incident associated with radiation must be reported immediately to the RPS, Main Control Room (MCR) and the Radiological Protection Adviser.
10. Sample handling information can be found in ISIS/EOI1.
11. Any beamline components or materials exposed to the neutron beam will be treated according to ISIS/SI16.

15. Risk Assessment

Operational risks assessments have been completed for all experiment and experiment support work on the beamlines. Safety aspects of all other work in the experimental hall is managed according to OPI209.

16. 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.

HSN20 contains the contingency plans for accidental injury whilst handling radioactive material. ISIS/EOI1 includes plans for handling sample contamination.

OPI305 covers the contingency plans for accidental radiation exposures.

16.1 Fire

OPN184 refers.

If you discover a fire:

- Break glass alarm.
- Shout to alert persons nearby.
- Dial RAL Site Security on 2222 (01235 778888 from a mobile)
- Give location of fire.
- Secure any radioactive material if it is safe to do so.
- Inform Paul Wright or Andy Scott (contact details in section 3 of this document)

If you hear the fire alarm:

- Secure any radioactive material if it is safe to do so.
- Leave the area by the nearest exit
- Go to the Fire Assembly Area and
- Check on the presence of colleagues known to be at work.

16.2 Loss or damage to radioactive materials

In the event of loss or damage to any radioactive materials, inform the RPS immediately.

If there is any possibility of contamination then evacuate and secure the area.

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

16.3 Damage or reduction of radiation shielding

In the event of any damage or reduction to any of the radiation shielding close the shutter and report the incident to the Duty Officer and Instrument Operations Group Leader immediately.

16.4 Accidental injury

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 RPS, who will instigate an investigation. HSN20 contains the contingency plans for accidental injury whilst handling radioactive material. ISIS/EO11 includes plans for handling sample contamination.

17. Documentation

A copy of these rules must be placed on the wall near the entrance to the area.

Hardcopies are also available at the ISIS Main Control Room and with the RAL RPA.

An electronic version should be stored on the ISIS Health and Safety Sharepoint area under 'Local Rules'.

The following must also be clearly available in the area:

- Copies of specific operating procedures.

- Risk Assessment for the area.

- HSN20

These rules must be reviewed, and appropriately amended, not later than 1 year from the date below.

Other relevant information:

- Certificates issued to RAL by the EA under RSA93

- The Ionising Radiations Regulations 1999

- Approved Code of Practice

- STFC Safety Codes

- RAL HSN 20 and 30

- ISIS Safety Instructions 15 and 16

- Experimental Operating Instruction 1

- Panalytical Risk assessment for "Installation, service and maintenance of X-ray diffractometer X'Pert MPD-MRD-Pro PW3040/X0"

- Panalytical Ltd Local Rules

Method statement for “Delivery and installation of diffractometer and X-ray diffractometers”.

18. Authorisation

Compiled by: Area Supervisor		Date
Advised by: P Wright, RPA		Date
Authorised by: Division Head responsible for this Radiation Controlled Area		Date