

Review of BPM at University of Sheffield

Introduction

The use of Best Practicable Means (BPM) in relation to the accumulation and disposal of radioactive wastes is now a requirement of all Environment Agency (EA) certificates of waste authorisation. We are required to use BPM to:-

- justify the use of radioactive materials
- minimise activity and volume of radioactive waste generated
- dispose of radioactive waste so as to minimise the impact on the environment and the public.

All facilities used for the disposal and storage of radioactive waste should be maintained in good repair. This will relate to LEV, drainage systems and solid waste storage facilities. We are also required to routinely check effectiveness of procedures, systems and facilities in meeting the requirements of BPM. Staff should be adequately trained to meet the requirements of BPM and appropriate records must be kept to demonstrate compliance.

This BPM review relates to work with radioactive materials at all University of Sheffield sites covered by the following waste authorisations:

- 1) BU7073, 13/06/03, University Buildings, Western Bank
- 2) BL2068, 17/07/01, University of Sheffield Medical School, Royal Hallamshire Hospital
- 3) BI6287, 26/06/00, University of Sheffield Clinical Sciences, Northern General Hospital

Justification

BPM starts with a justification for the use of radioactive material and an assessment of the radioactive waste that is likely to be produced.

We have covered this requirement by our revised work certificate application form which was introduced in Oct 2002 (<http://www.shef.ac.uk/safety/ir/regforms.html>). This requires the user to make a justification statement and also ask for an estimation of the various waste streams, potential activities to be used in the experimental work and the frequency of these activities. Areas where work is to be carried out are inspected by Safety Services.

Gaseous disposals are kept to a minimum with gases trapped and recycled where reasonably practicable.

Solids are stored for decay to minimise disposal costs and environmental impact.

Aqueous wastes are disposed of without delay to minimise the risk and impact of accidental spillages. This is justified because of the limited aqueous disposals and the correspondingly low environmental impact.

Environmental Impact Assessments have been made in the past as part of the authorisation process. - *These need to be updated as necessary and collated together with this BPM review.*

Operational Procedures

The competent person for management of radioactive waste procedures and compliance with the conditions of Authorisation under the Radioactive Substances Act 1993 is the RPA Mr T.J.Moseley. He is assisted by Dr P.A.Harris who is responsible for the day-to-day running of the waste stores and decay store, collection of radioactive wastes (solid and scintillant wastes), sorting, storing and onward transfer of wastes to White Rose Environmental. In departments it is the responsibility of the DRPS to organise waste removal (solids and scintillant waste) to the waste stores and if necessary delegate this responsibility to a suitably trained technician.

In departments- waste should not be stored for more than one month. It should be stored in lidded containers that are appropriately shielded. Long-lived radionuclides (H-3, C-14, Ni-63) should be kept separate from short-lived radionuclides and scintillant waste should also be stored separately in lidded plastic tubs. At the end of each month, after monthly usage records have been collated, waste should be bagged up and labelled with details of radionuclides, activities and a reference date for the waste. The waste should then be deposited in the appropriate waste store and logged in the waste deposit book.

In the waste stores - separate areas are labelled for waste to be deposited by departments. At least once/month the waste is checked, sorted and logged onto computer by Safety Services staff. It is then given a unique bag reference number segregated according to half-life and put into 240L containers ready for transfer to the decay store in the Husband Building. Procedures for the collection and transfer of waste to the Husband Building and subsequent transfer to an Authorised Contractor are documented in the 'Quality Assurance Programme for the Transport of Radioactive Waste' held in room A1 Safety Services.

Storage in the decay store is up to 6 months in accordance with the Western Bank Certificate of Authorisation - BU7073 dated 13/06/2003. The timing of this accumulation period is from when the waste is first deposited in any of the Western Bank waste stores. Permitted storage time at RHH is 3 months and at NGH is 6 months. All short-lived radionuclides will be stored until the activity is insignificant (<0.1MBq/bag) or the 6 months storage time has been reached, whichever occurs first. All long-lived radionuclides will be disposed of at the earliest opportunity. We normally have a collection by White Rose Environmental once every 3 months when an economic load of 6 x 820L wheelie bins should have been accumulated. (8 m³ is our maximum permitted storage volume.)

Monitoring of the waste for external dose-rates is performed prior to any transport movement and recorded on consignment certificates. (In most cases dose-rates are less than 5uSv/h and waste is transported as excepted packages.) Monitoring of the waste stores is undertaken periodically after the store has been emptied of waste. - *This monitoring needs to be documented.*

We also have procedures for registration of workers, registration of new projects, inspection of facilities, designation of laboratories monitoring etc (see -

<http://www.shef.ac.uk/safety/ir/localrules.html>)

Facilities for Waste Disposal

BPM requires facilities to be well maintained with documented reports of inspections and remedial actions taken.

All FCs checked on an annual basis as part of LEV maintenance programme. Gaseous disposals very limited and subject to assessment by RPA before approval to ensure FC is adequate and discharge points acceptable.

Drainage systems in labs checked on an annual basis and all discharge points and drains marked. Sinks have to have small U bends or P traps to be approved for low-level disposals. High-level disposals to be down a sluice or sink whose drain goes directly to a main drain.

Waste stores for accumulation of radioactive solid waste are checked on a monthly basis when the waste is logged in by Safety Services. Stores to be kept clean and tidy by Safety Services staff. - *It has been noted that all our stores have concrete floors that are not sealed and unsealed walls and ceilings. It has been decided that sealing the floors and 15cm up the walls is something that should be carried out for BPM but that there is no justification for sealing the walls and ceilings and no bunding required.*

All areas where work with radioactive materials takes place are subject to annual inspection. A written report is made of this inspection and any deficiencies in laboratory conditions are highlighted for remedial action to be taken. RPSs are requested to report back when items have been addressed. Records of inspections kept in Departmental Files in Safety Office.

Staff Training

BPM and its requirements should be covered in the training of staff.

All new radiation workers receive introductory training and this emphasises the need for justification and optimisation, only using radioactive materials if they are the best option and then using the minimum quantities and the radionuclides with the minimum radiotoxicity. Information is also given on waste segregation and packaging procedures. This generic information is then followed up in departments with more specific information relating to the individuals work in the department.

Summary

Most current procedures are considered adequate and in keeping with BPM.

Highlighted items above will be addressed in the coming financial year.

T.J.Moseley RPA 20/04/2004

Update 20/08/04

Western Bank waste stores and the Husband Building Decay Store have had their floors sealed and a 15cm upstand painted using 2-pot epoxy resin. Hospital stores being reviewed by Mark Singleton, RPA for STH.