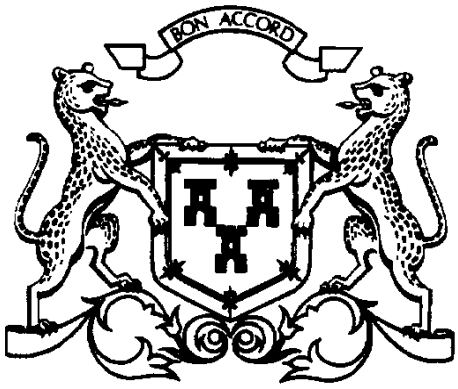

ABERDEEN CITY COUNCIL

MANAGEMENT OF RADIOACTIVE SOURCES IN SCHOOLS

POLICY & PROCEDURE

Approved by the Resources Management Committee on 21 November 2006

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SECTION 1: POLICY STATEMENT

Introduction

Aberdeen City Council recognises its duty to ensure, so far as is reasonably practicable, the health, safety and welfare of employees and those effected by its activities. The Council recognises the potential adverse health effects of exposure to radioactive materials and acknowledges the importance of controlling and minimising so far as is reasonably practicable such exposure in the workplace.

Aberdeen City Council is a radiation employer because during the course of its activities radioactive materials are used in demonstration experiments in schools. Therefore, the organisation has to comply with the Ionising Radiation Regulations 1999 (IRR99).

Scope

This policy applies to all Council premises where radioactive materials are used and to all employees, pupils, persons on business, contractors and members of the public using such Council premises.

Core principles

- Develop and implement an effective health and safety management system to protect the health of employees and other persons from the risks arising from exposure to radioactive sources.
- Identify those employees and other persons who may be at risk from radioactive sources and assess the degree of risk.
- Co-operative working between management and employees to ensure that all significant risks are assessed, eliminated or adequately controlled.
- Introduce reasonably practicable control measures to minimise the risks from the use, storage, transfer and disposal of radioactive sources.
- Provide employees with appropriate information, instruction and training.

SECTION 2: RADIOACTIVE SOURCES PROCEDURE

Responsibilities - Radiation Protection Adviser

Aberdeen City Council has appointed a Radiation Protection Adviser (RPA) who is an employee of the Scottish Schools Equipment Research Centre (SSERC). The RPA must be consulted by the appropriate representative of the Council (e.g., Neighbourhood Services Area Facilities Manager) in connection with the following matters.

1. To undertake prior examination of plans for installations and the acceptance into service of new or modified sources of ionising radiation in relation to any engineering controls, design features, safety features and warning devices provided to restrict exposure to ionising radiation.

2. The regular calibration of equipment provided for monitoring level of ionising radiation and the regular checking that such equipment is serviceable and correctly used.

3. The periodic examination and testing of engineering controls, design features, safety features and warning devices and regular checking of systems of work provided to restrict exposure to ionising radiation.

As part of the record and audit process, Aberdeen City Council, in liaison with the RPA will organise checks within school science departments in respect of activities with radiation sources. The checks will ensure that:

- each school's radioactive sources are kept in an appropriate, locked store with the store itself being permanently secured to the building;
- the location of the store is at least 2.5 m distant from where staff habitually work, or at least 1.5 m from where pupils sit:
- the store is marked with the appropriate warning sign;
- sources in the store are kept in suitable receptacles;
- the protactinium generator is kept upright in a glass beaker;
- gamma sources are kept at least 20 cm back from the cabinet door;
- an accounting record of holdings of radioactive materials is kept and updated regularly, as to be advised;
- the accounting record is accurate;
- the radioactive materials held comply with SEED recommendations, conditional on advice from their RPA;
- radioactive sources are leak tested at least once every 2 years (preferably annually if the source is aged); and
- the protactinium generator has been withdrawn from use.

The RPA will record his / her findings which shall be incorporated into the "Working with radioactive substances: Record and management list" document. The RPA shall submit any recommendations / remedial actions to the Head Teacher and Neighbourhood Services Area Facilities Manager.

Responsibilities - Radiation Protection Supervisor

A person within a science department must be designated as the nominated person to manage radiation protection at the school. For the purposes of this policy the designated person undertaking these duties will be referred to as the Radiation Protection Supervisor (RPS). This will usually be the Principal Teacher, Physics, but may be another nominated appropriate person within a staffing structure which does not include the post of Principal Teacher of Physics. This person must have a nominated Deputy to cover absence or non-availability of the RPS.

The RPS must be someone who works with radioactive materials, has some understanding of radiological protection and has received appropriate training.

The RPS within the school has responsibility for managing the work with radioactive substances. This will include undertaking an annual audit and recording the findings on the "Working with radioactive substances: Record and management list" documentation. The RPS will liaise / consult with the RPA. The RPS will undertake the following checks to ensure compliance with this Policy. The checks will ensure that:

- a log of the usage, transfer, movement, etc of radioactive sources held in the store is maintained;
- the "Safety Arrangements Working with radioactive sources – What you should know and do" notice is displayed on the science department notice board and has been brought to the attention of staff;
- a check is made every month (except summer vacation) to ensure that the radioactive contents of the store correlates with the accounting record and these checks are recorded in the Log Book;
- a suitable perspex screen is available and used to screen beta radiation;
- pupils under the age of 16 do not work with radioactive sources;
- there is a risk assessment for any Advanced Higher Investigation with radioactive sources;
- any disposal of radioactive materials are arranged through SSERC in liaison with the Facilities Manager;
- any student teacher working with radioactive sources is continuously supervised by a qualified teacher; and
- a contingency plan has been compiled and is maintained.

The RPS shall ensure that written arrangements for the use of ionising radiation materials / sources have been drawn up, in consultation if necessary with the RPA, and that they are adhered to within the school.

The RPS must ensure that the Log Book is maintained so that the whereabouts of radioactive sources remains known at all times. This will also enable the RPS to identify any suspected loss so that the necessary remedial action can be taken to make a recovery of any missing source/s.

The accounting record must also be updated to reflect any transfer of materials to an alternative storage location, e.g. during a planned refurbishment of a science lab/s, where a source is disposed of via SSERC, etc.

Information, Instruction and Training

The person responsible for health and safety arrangements within the school (e.g. Head teacher) must ensure that the RPS and other teachers / technicians where appropriate receive specific safety training in respect of working with radioactive sources and use of equipment in school laboratories.

New members of staff to an establishment who are expected to work with radioactive substances and materials shall be given the appropriate instruction and information as part of the induction training of their new working environment.

Staff with training needs	**Scope of training**
RPS	One-day course on radiological protection
Physics teachers Chemistry teachers if they work with radioactive materials	One-day course on radiological protection
New staff Probationary teachers Student teachers	Induction training by RPS
Technicians if they work with radioactive materials	Either a half-day course on handling radioactive materials, or the one-day course on radiological protection

The Head Teacher and the RPS must maintain a record of staff who have received training.

Persons who may be at risk and in need of information, instructions and supervision include:

- Physics teachers
- Teachers of other sciences
- New teachers
- Temporary teachers
- Probationary teachers
- Student teachers
- Technicians
- Other employees, (e.g. cleaners, janitorial staff, etc)
- Pupils

Each group will require separate arrangements, which will include the following.

Safety Arrangements on Working with Radioactive Sources - What you should know and do poster displayed in the staff area, including the technicians room.

Ensure that the safety notes on working with radioactive materials are available to staff. These can be downloaded from the SSERC website.

Appropriate instructions must be issued to teaching and non-teaching staff.

Documentation

Schools must hold the following documentation.

Document Name	Comment
Working with radioactivity: What you should know and do	Poster
Working with radioactive substances: Record and management list	Pro forma and log books in relation to radiation sources / materials must be kept separately from the radiation store.
Risk assessment: Use in schools of sealed radioactive sources	
Contingency plans	Planning for unusual occurrences
Protocol on the ageing and leak testing of sealed radioactive sources	
Leak test analysis	Excel file for analysing leak test results
Radioactive source storage	
Security of radioactive holdings	Advice of source security from analysing incidents of source losses
A sourcespotter's guide to radioactive materials	An aid to identifying sources
Radiological protection in schools: Training needs	Guidance for councils

See the SSERC website to download the relevant files. Please note that these files are reviewed and modified from time to time. Notice of updates will be shown on the website and published in the SSERC Bulletin. Notice will also be posted on the IOP's SPUTNIK discussion group for physics teachers

Working Procedures

There should be a generic risk assessment undertaken in connection with working with radioactive materials in the school. Risk assessments should also be made in respect of student practical Advanced Higher investigations. Risk assessments are available from SSERC on the use of:

- Amersham sealed sources;
- Inverse square law demonstration with gamma radiation;
- Half-value thickness demonstration with gamma radiation;
- AEA Isotrak Cs-137/Ba-137m Isotope Generator; and
- Geological specimens of radiological minerals.

A log book must be kept to record the withdrawal of sources from the store.

Beta sources are the main risk of high dosage to the user. Irradiation can be limited by standing back 1 m, to the rear or side of the source, and shielding with perspex.

A review of the arrangements for the security of radioactive sources must be undertaken during the audit.

Stock List

Stock must be checked every month except in the summer vacation. The record of checks must be kept in the log book.

A record must be made of all radioactive materials held by the science department in the “Stock list” section of the “Working with radioactive substances: Record and management list” document. Instructions in respect of completing the stock list are given on the document. To help with identifying sources, please look at ‘A sourcespotter’s guide to radioactive materials’, published by SSERC.

Storage

Radioactive sources must be stored in a lockable, steel cabinet secured to the building. The RPS has responsibility of security of the key to the cabinet.

Any withdrawal of a radiation source/s from the store must be recorded in the log book.

Warning labels must show the standard pictogram for ionising radiation. If the storage cabinet is in a cupboard, both the cabinet and the cupboard doors shall be labelled. If the storage cabinet is in a room, the doors of the room do not need warning labels displayed on them provided that the warning labels on the cabinet can be easily seen from a distance.

Gamma sources should be sited at the rear of the storage cabinet. Sealed sources should be kept within proper receptacles.

If the storage cabinet is in a room where staff work, the exterior dose rate should not exceed 2.5 µuSv h-1. This condition is met by placing gamma sources more than 20 cm back from the cabinet door.

Distances refer to the separation in metres (m) between the storage cabinet and any place where an employee or pupil habitually works or sits. Unless there is extra shielding, the distance should be at least 1.5 m from where a pupil sits, 2.5 m from where a teacher sits and 3 m from where a technician routinely works.

The protactinium generator should be withdrawn from use and kept secured in the radioactive materials store. It must be stored upright inside a glass beaker until it can be safely disposed of.

Leak Testing

To prevent radioactive contamination, sources should be in a sealed form whenever practicable. The term “sealed source” is defined in IRR99 to mean any radioactive substance whose structure is designed to prevent, under normal conditions of use, any dispersion of radioactive materials into the environment. Coming within the scope of sealed sources is the protactinium generator.

Refer to “Protocol on ageing and leak testing sealed radioactive sources” issued by SSERC April 2004.

If practicable, a leak test on a source must be undertaken at least once every two years. However, where sources are “old” there may be a requirement to increase this frequency to annually, dependent upon the results of the risk assessments undertaken in respect of the radioactive materials in the school.

Advice and procedures in respect of testing for leakage of radioactive material and the frequencies of when tests should be undertaken is available from the RPA.

Disposal Arrangements

The Neighbourhood Services Facilities Manager will arrange for the disposal of radioactive materials in consultation with SSERC. The RPA’s advice must be obtained regarding any disposals.

SSERC operates a batch disposal service. There is a charge for disposal per source.

The RPS shall agree with the RPA a programme for the disposal and possible replacement of redundant or aged radioactive materials phased over a period of time. This programme is co-ordinated by the Facilities Manager in conjunction with the school.

A record of any disposals of radioactive materials made over a two year period must be completed in the "Disposals" section of the "Working with radioactive substances: Record and management list" document.

Contingency Plan

In accordance with IRR99 the school must prepare a contingency plan. The RPA has prepared a set of generic plans, which should be downloaded from the SSERC website. The plans cover fire, loss, interruption of work by a fire alarm, irregular holdings and acquisitions, irregular practices by employees, contamination and pupil indiscipline. These plans must be adapted for the individual location. The location of radioactive sources should be lodged with the local Fire Service.

The plans should be read by any staff who need to know about them, which generally should include physics and chemistry teachers, and technicians. Departmental time should be provided each year for training or refresher training, and monitoring and review.

Within the contingency plan the name and a telephone number of the hospital which will provide advice in the event of an accident shall be included. In the case of Aberdeen City Council schools, the hospital shall be Aberdeen Royal Infirmary (ARI).

The RPS within the school shall make the Head teacher and the school safety committee aware of the health and safety arrangements for complying with IRR99.

Accident and Incident Reporting

All injuries and dangerous occurrences shall be recorded on the "Report of an injury or dangerous occurrence" form (F2508). The original form must be sent to the Neighbourhood Services Management Area Facilities Unit in accordance with the arrangements for reporting injuries and dangerous occurrences.

All incidents involving disruptive behaviour, vandalism, loss and/or damage to property and breaches of security must also be reported.

The person reporting the incident should complete the Corporate Incident Report form and forward to their Line Manager for action. The Line Manager should then take any appropriate action, complete and sign the form, and forward, along with a copy of any correspondence in accordance with the Neighbourhood Services Management Area's arrangements for reporting incidents.

The Facilities Manager shall report any incidents involving radioactive materials to the HSE and SEED.

The Facilities Manager shall also inform the RPA of any incidents / suspected incident (including loss or theft) involving radioactive materials to gain appropriate advice as to which enforcing authorities (HSE, SEPA, Police) need to be notified in which circumstances.

If the RPA becomes aware of any missing radiation sources or incidents during an audit, check, visit, etc, he / she shall inform the Facilities Manager.

The Contingency Plan shall include specific procedures to follow in the event of an accident and/or incident.

Audit

An audit of the management of working with radioactive materials must be undertaken annually by the RPS. “The Working with radioactive substances: Record and management list” document shall be used to record the findings.

Copies of the audit must be retained by the;
- Science Department to which it applies;
- Headteacher of the school to which it applies;
- Facilities Manager; and
- Neighbourhood Services Management Area Head of Service.

Any remedial actions identified in the audit shall be documented and included in an action plan together with target dates for completion. Dates will depend on the severity of the risk, therefore the higher the risk the shorter the time scale. Items may have financial implications for which appropriate budgeting must be planned or requested from line management.

A full audit of all health and safety management arrangements within a school shall be undertaken annually by the Head teacher. Aberdeen City Council Health & Safety Advisers audit the higher risk activities within schools, which includes activities within science departments.

The line manager (e.g. Head teacher) of the service/section/area is responsible for drawing up and implementing an action plan based on the outcome of these audits.

SECTION 3: REVIEW OF THE PROCEDURE

The Corporate Governance Service will review this procedure every three years. It will, nevertheless, be subject to continual review and amendment in the light of experience of its operation and statutory requirements. Changes will only be put into effect following the normal consultation arrangements.