

Radiation Guideline 2:
Preparation of radiation safety manuals



Department of
**Environment and
Conservation (NSW)**



From 24 September 2003 the Department of Environment and Conservation (DEC) incorporates the Environment Protection Authority (EPA), which is defined in section 4 of the *Radiation Control Act 1990* as the Authority responsible for administering the Act and Regulation. Statutory functions and powers in the *Radiation Control Act 1990* continue to be exercised in the name of the EPA. For further information on the matters discussed in this document contact RadiationControl on (02) 9995 5959 or email radiation@environment.nsw.gov.au.

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1. Introduction

Under clause 16 of the Radiation Control Regulation 2003 (the Regulation), an employer must, if required to do so by the Director General, prepare or adopt a radiation safety manual relevant to the particular area of work. Clause 16(4) requires that a safety manual must conform to the guidelines outlined in the Department of Environment and Conservation's (DEC) publication: *Radiation Guideline 2 – Preparation of radiation safety manuals*. The manual, once prepared, must be submitted to DEC for approval.

This document provides minimum advice on what a safety manual should contain and is intended as a guide only. A safety manual may be prepared by the organisation, a consultant or an associated interstate or overseas organisation. Where 'ready made' manuals are being considered, they should first be read carefully by the employer to ensure that they conform to the requirements of the Regulation, for example, that they use the required units of measurement, such as SI units, or apply the correct system of dose limitation. It may be adequate to adopt a relevant standard or use the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) codes and standards, but it will be necessary to state whether the 'adopted' document is to be applied in whole or in part and, if the latter, which particular parts apply.

2. Preparing a radiation safety manual

The purpose of this section is to provide brief guidance on the matters to consider when preparing a radiation safety manual. It does not provide an exhaustive list and each organisation will need to identify their own requirements specific to the industry. This section is only concerned with matters related to radiation safety. Any other hazards, for example, fire, chemicals and explosions will not be considered in any detail and should be covered under other areas of occupational or public health.

The subjects to be covered in a radiation safety manual should include the following:

2.1 Work program

This section should contain a brief description of the work involving the use of radiation. It will need to be reviewed from time to time to allow for changes to the work program.

2.2 Safe working procedures

This section should provide guidance on how the various work functions should be safely carried out. It should also contain some advice on the approach to special or one-off practices.

2.3 Equipment required

This section should list the equipment required for each work project, particularly with respect to safety items. It should include monitors, safety signs, barriers, general shielding, and any special emergency equipment; for example, radioactive source recovery tools and long handling tongs.

2.4 Hazards to occupationally exposed employees

This section should provide details of the possible ways in which operators could become exposed to radiation and should give a brief summary of the radiation hazards. Most ARPANSA codes and standards contain a short section on the hazards of radiation exposure and these could be reproduced in this section of the manual. Reference should also be made to possible accidental exposures. The Regulation specifies that it is the employer's responsibility to inform occupationally exposed persons of changes to safety-related information in the workplace.

2.5 Hazards to members of the public

For the purpose of the manual a non-occupationally exposed employee is a member of the public.

This section should provide details of how members of the public may receive radiation exposure as a result of routine work and the consequence of possible accidents. This is of particular importance if work is to be carried out in a non-occupationally controlled area such as a street, home, public building or park.

2.6 Special safety requirements

This section should identify hazards that may be present which are unique to the organisation and could give rise to radiation exposure. It should also cover the possibility of unexpected events such as fires, explosions and theft that could jeopardise control over the safety of the radiation source.

2.7 Care of safety equipment

This section should contain information on the location of all safety equipment and the procedures to be followed during a routine inspection for damage and tracking of such equipment when in use or being maintained. The procedures should identify the person responsible for maintaining this equipment and provide contact details for this person.

2.8 Area monitoring

This section should cover area surveys and the recording of monitoring results that may be required to be carried out by the organisation. It should identify the appropriate monitors (energy and dose range) available for the task(s) and the number that are optimally required. This section should also specify a maintenance and calibration schedule and the methodology for keeping and reviewing safety records.

2.9 Personal monitoring

This section should state the rules surrounding the issue and maintenance of personal monitors and the assessment of personal dose monitoring. It should identify the groups within the organisation that are required to be issued with personal monitoring devices and any rules relating to their wearing, handling and care. It should also provide information as to what to do in the case of high doses of

radiation exposure being recorded, including the requirement to report such cases to DEC. Other than electronic monitors, personal monitors should not be shared by personnel.

The manual should state the person responsible for personal monitoring within the organisation, for example, Radiation Safety Officer.

2.10 Employer responsibilities

This section should provide details of the responsibilities specific to a particular employer in relation to radiation safety, for example, making equipment available, repairing or replacing equipment, assigning duties or record keeping.

2.11 Employee responsibilities

This section should clearly set out the responsibilities of employees in relation to radiation safety within the organisation; for example, safe working practices, using safety equipment properly, reporting faulty equipment and reporting accidents.

2.12 Emergency plans

This section should contain an emergency response plan that clearly sets out details of the type of accidents that may happen, the response, the remedial action, and follow-up action. Such a plan should assign duties and provide details of persons to contact, for example, management, safety officer and the relevant statutory authority.

2.13 Radiation Safety Officer

This section should contain the contact details of the Radiation Safety Officer. It should set out the roles and responsibilities of that person, or the person responsible for radiation safety within the organisation. For example, the roles and responsibilities should include:

- the preparing of the radiation safety manual and ensuring that it is kept up to date and is made available to all employees; preferably each employee should receive a copy
- ensuring that all persons who are required to be issued with a personal monitoring device have one
- changing personal monitoring devices at the right time
- investigating apparent high doses
- the preparation of high-dose reports for the employer and DEC.

2.14 Waste disposal

This section should include information on policies and procedures relating to the handling, storage and disposal of waste containing radioactive materials. It should also provide clear advice on any legal requirements that need to be complied with regarding disposal of radioactive substances.

3. Sample layout

A suggested set of chapter headings that could be used when drafting a radiation safety manual is provided in Appendix 1.

Sample layout for radiation safety manual

A manual, to be useful to the organisation, should contain all the necessary background and operational information for working with radiation. It should be the first point of reference for staff, and should provide supervisors with all necessary policies and procedures.

The content, **which should be kept up to date**, should include:

1. The authority of the manual (e.g. Executive policy statement)
2. A distribution list
3. General information on radiation:
 - 3.1 Nature of radiation and unit of measurement
 - 3.2 Affects and risks associated with radiation (including radiation and pregnancy)
 - 3.3 Sources of radiation exposure (including background)
 - 3.4 Objectives of radiation protection
4. Control of radiation
 - 4.1 Procedure for radiation safety within the organisation including the appointment of a Radiation Safety Officer and the duties and responsibilities of the Radiation Safety Officer
 - 4.2 The Act and Regulation, and their impact on the organisation
 - 4.3 Responsibilities of employees and the employer
 - 4.4 Monitoring of radiation (personal, area, laboratory etc)
 - 4.5 Special procedures such as purchasing
 - 4.6 Use, maintenance and calibration of radiation measuring instruments
5. Local rules/procedures – one section for each area/application. Uses of unsealed sources may be covered in a generic section or in separate sections as appropriate. The various sections should all have a similar format. For example:
 - 5.1 Description of the area/procedure
 - 5.2 Nature of the hazard
 - 5.3 Procedure/equipment/facilities required

- 5.4 Emergency procedures (should include a brief description of the type of emergencies that could occur)
- 5.5 Staff responsible and contact procedures
- 6. Handling of radiation accidents:
 - 6.1 Possible types of accidents
 - 6.2 Procedures for handling each type
 - 6.3 General emergency procedures
 - 6.4 Contact names and phone numbers
 - 6.5 Reporting requirements
- 7. Handling, storage and disposal of radioactive waste (where relevant)
 - 7.1 Sources and categorisation of waste
 - 7.2 Conditioning/packaging
 - 7.3 Storage procedures (identification, location, record keeping etc)
 - 7.4 Disposal procedures (when, how, who authorises it etc)
- 8. Record keeping, general requirements:
 - 8.1 Inventory of x-ray units and radioactive sources
 - 8.2 Testing where required (for example, wipe tests on radioactive sources)
 - 8.3 Storage of records
 - 8.4 Who is responsible
- 9. Examples of possible radiation doses associated with diagnostic, therapeutic, scientific or industrial procedures
- 10. Examples of any forms to be used in implementing this guideline