



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

CODE OF PRACTICE

Security of Radioactive Sources

RADIATION PROTECTION SERIES No. 11

Radiation Protection Series

The ***Radiation Protection Series*** is published by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to promote practices which protect human health and the environment from the possible harmful effects of radiation. ARPANSA is assisted in this task by the Radiation Health and Safety Advisory Council, which reviews the publication program for the ***Series*** and endorses documents for publication, and by the Radiation Health Committee, which oversees the preparation of draft documents and recommends publication.

There are four categories of publication in the ***Series***:

Radiation Protection Standards set fundamental requirements for safety. They are prescriptive in style and may be referenced by regulatory instruments in State, Territory or Commonwealth jurisdictions. They may contain key procedural requirements regarded as essential for best international practice in radiation protection, and fundamental quantitative requirements, such as exposure limits.

Codes of Practice are also prescriptive in style and may be referenced by regulations or conditions of licence. They contain practice-specific requirements that must be satisfied to ensure an acceptable level of safety and security in dealings involving exposure to radiation. Requirements are expressed in ‘must’ statements.

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Safety Guides provide practice-specific guidance on achieving the requirements set out in **Radiation Protection Standards** and **Codes of Practice**. They are non-prescriptive in style, but may recommend good practices. Guidance is expressed in ‘should’ statements, indicating that the measures recommended, or equivalent alternatives, are normally necessary in order to comply with the requirements of the **Radiation Protection Standards** and **Codes of Practice**.

In many cases, for practical convenience, prescriptive and guidance documents which are related to each other may be published together. A **Code of Practice** and a corresponding **Safety Guide** may be published within a single set of covers.

All publications in the ***Radiation Protection Series*** are informed by public comment during drafting, and **Radiation Protection Standards** and **Codes of Practice**, which may serve a regulatory function, are subject to a process of regulatory review. Further information on these consultation processes may be obtained by contacting ARPANSA.



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Radiation Protection Series Publication No. 11

January 2007

This publication was approved by the Radiation Health Committee on
28 November 2006 and on 8 December 2006 the
Radiation Health and Safety Advisory Council advised the CEO
to adopt the Code of Practice

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The mission of ARPANSA is to protect the health and safety of people, and to protect the environment, from the harmful effects of radiation.

Published by the Chief Executive Officer of ARPANSA in January 2007

Foreword

In 2002, the Radiation Health Committee (RHC) considered the security of Australia's sealed radioactive sources in the light of the increased potential for such sources to be used in terrorism. Later in the same year, the Committee published a national strategy and action plan which included a recommendation that a national set of security requirements be developed for sealed radioactive sources. This Code gives effect to the recommendation.

The Code has been developed on the basis that security outcomes should apply in a graded manner, that is, the stringency of the security measures should be proportional to the likelihood of the source or aggregation of sources being acquired and the consequences of malicious use. Using a risk management methodology that draws on the International Atomic Energy Agency's (IAEA) *Categorization of Radioactive Sources Safety Guide*, IAEA Safety Standard Series No. RS-G.1.9¹, the Code of Practice categorises radioactive sources into five categories and allocates security outcomes commensurate with the risk posed by sources in each category. In practice, the Code only requires additional security measures, other than reporting of security breaches, for Category 1, 2 and 3 sources because the security measures in place for safety purposes are considered adequate to ensure the physical security of Category 4 and 5 sources.

While the Code of Practice sets clear objectives for improving the security of radioactive sources, its effective implementation relies on the development and maintenance of an effective security culture. Such a culture consists of characteristics and attitudes in organisations, and of individuals, that ensure security issues receive the attention warranted by their significance. It is vital that this culture be instilled as early as possible.



John Loy PSM
CEO of ARPANSA

23 January 2007

¹ This document is available on the internet at web address:
http://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf

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1. Introduction

The *Code of Practice for the Security of Radioactive Sources* gives effect to the agreement of the Radiation Health Committee in November 2002, that a set of security outcomes be developed and considered for inclusion in the *National Directory for Radiation Protection*.

1.1 PURPOSE

The purpose of this Code of Practice is to set out the security requirements to be implemented by persons dealing with a radioactive source in order to decrease the likelihood of the unauthorised access to or acquisition of the radioactive source by persons with malicious intent.

It is intended that this Code be given the force of law by each State and Territory and the Commonwealth, and administered by the regulatory authority in each jurisdiction as part of the regulatory framework governing the use of radiation. Refer to Annex 2 for details of the regulatory authorities.

1.2 SCOPE

This Code of Practice applies to a person dealing with a sealed radioactive source other than in circumstances where the *Civil Aviation Act 1988* or the *Navigation Act 1912* apply to that person.

This Code does not apply to a person dealing with an unsealed radioactive source.

1.3 APPLICATION OF THIS CODE OF PRACTICE

The security requirements to be applied to a radioactive source depend on the category of the radioactive source and the threat level for a radiological attack set by the Australian Government. In accordance with the National Counter Terrorism Plan², the threat level and accompanying threat assessment will be communicated to state and territory police. The police will then communicate information about the threat and the threat level to the regulatory authority or to the person responsible for managing the source (referred to in this Code as the Responsible Person), consistent with the National Counter Terrorism Handbook. Further information about the threat levels can be found in Schedule C.

This Code of Practice categorises radioactive sources into five categories and allocates security outcomes commensurate with the risk posed by sources in each category. This categorisation was informed by risk analyses that considered the major applications of radioactive material in Australia. Category 1 sources are considered to pose the highest risk and are therefore subject to the most stringent security outcomes. In practice, the Code only requires additional security measures, other than reporting of security breaches, for Category 1, 2 and 3 sources because the security measures in place for safety purposes are considered adequate to ensure the physical

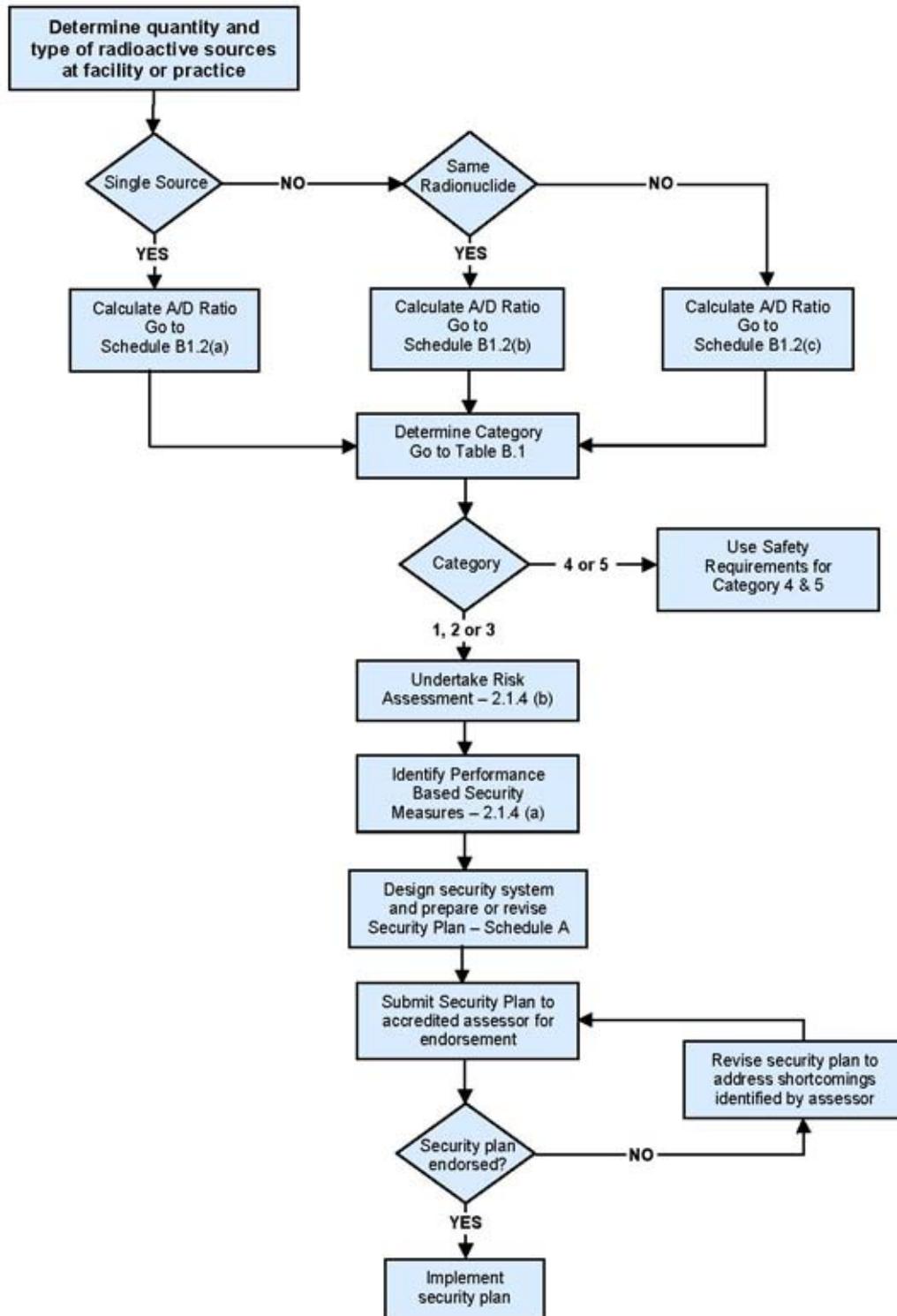
² Available from
<http://www.nationalsecurity.gov.au/agd/www/nationalsecurity.nsf/Page/Publications>

security of Category 4 and 5 sources. Each Category 1, 2 and 3 source will be subject to a security plan that must be endorsed by an assessor accredited by the regulatory authority.

The threat levels grade from ‘negligible’ to ‘extreme’. The Code links expected procedural security outcomes to the threat level. A change in the threat level would change the procedural security outcomes a person dealing with a Category 1, 2 or 3 radioactive source would be required to achieve.

Figure 1 is a logic flow chart representation for the application of the Code.

Figure 1. Logic Flowchart for Source Security



While the Code of Practice sets clear objectives for improving the security of radioactive sources, its effective implementation relies on the development and maintenance of an effective security culture. Such a culture consists of characteristics and attitudes in organisations, and of individuals, that ensure security issues receive the attention warranted by their significance. It is vital that this culture be instilled as early as possible.

1.4 RELATED INFORMATION

Additional guidance documents addressing the application of the Code (for both users and regulators) will be developed in consultation with the Radiation Health Committee.

Further information on the measures for improving security may be obtained from the current edition of the Attorney General's Department's *Commonwealth Protective Security Manual*.

Guidance on equipment endorsed by the Attorney General's Department's Security Construction and Equipment Committee (SCEC) for use in security applications may be obtained from the current edition of the *Security Equipment Catalogue*, available via the Australian Security and Intelligence Organisation (ASIO) website at www.asio.gov.au.

Further information regarding risk-management principles and their practical implementation can be found in the Australian and New Zealand Standard on Risk Management AS 4360:2004 and the associated Handbook.

2. Source Security – Responsibilities and Duties

2.1 RESPONSIBILITIES OF RESPONSIBLE PERSON

Source Categorisation

2.1.1 Each Responsible Person dealing with a radioactive source must ensure that each radioactive source or aggregation of radioactive sources under that person's control is assigned a security category based on the methodology specified in Schedule B.

Category 4 and 5 Source

2.1.2 The Responsible Person dealing with a radioactive source or aggregation of radioactive sources assessed as being in categories 4 or 5 must comply with Chapter 7 of the Code.

Category 1, 2 and 3 Source – Source Security Plan

2.1.3 The Responsible Person dealing with a security enhanced source other than for the purposes of transporting the source must:

- (a) formulate a Source Security Plan that demonstrates how the Responsible Person will satisfy the requirements of this Code in relation to the source and includes the information described in paragraph A.1 of Schedule A;
- (b) have the Source Security Plan formulated in 2.1.3(a) endorsed by an assessor accredited for this purpose by the regulatory authority; and
- (c) ensure that the Source Security Plan is implemented and complied with;
- (d) in the event that there is a change in the environment in which the dealing occurs - including new credible threat information - such that the Source Security Plan is no longer current, the Responsible Person must:
 - (i) submit, for endorsement in accordance with 2.1.3(b), a revised Source Security Plan addressing the change; and
 - (ii) implement and comply with the revised Source Security Plan.

Security Enhanced Source – Security Requirements

2.1.4 For each security enhanced source the Responsible Person must ensure that the source is protected by measures that:

- (a) meet the security outcomes specified in Chapters 3, 4, 5 and 6 of this Code as they apply to the relevant category of the source; and

- (b) have been developed using a risk-based process³ that:
 - (i) describes the source, the nature of the dealing, the environment in which the dealing occurs and existing security measures that protect the source;
 - (ii) identifies the credible threats to the source in relation to the dealing and the likelihood and consequence of the threats occurring;
 - (iii) initially, and during review processes, assesses the effectiveness of existing security measures to achieve the security outcomes taking into account the threat; and
 - (iv) if required, identifies further or amended security measures necessary to achieve the security outcome.

Security Enhanced Source – Access

- 2.1.5 A Responsible Person who is a natural person or, if the Responsible Person is not a natural person, the natural person who oversees the implementation of the Code and associated security plans on behalf of the Responsible Person, must not deal with a security enhanced source unless the person has undergone a security background check in accordance with the requirements specified in Schedule E2.
- 2.1.6 The Responsible Person must ensure that a natural person (the ‘second person’) does not transport a security enhanced source unless the second person has a legitimate reason for transporting the source and has undergone a security background check in accordance with the requirements specified in Schedule E2.
- 2.1.7 Notwithstanding the transport measures in 2.1.6, the Responsible Person must ensure that a natural person, (the ‘second person’) does not deal with a security enhanced source unless the second person has a legitimate reason for dealing with the source and:
 - (a) for fixed or mobile sources:
 - (i) has undergone an identity check in accordance with the requirements specified in Schedule E1; or
 - (ii) is accompanied at all times by a person who satisfies the requirements of 2.1.7(a)(i);
 - (b) for portable sources:
 - (i) has undergone a security background check in accordance with the requirements specified in Schedule E2; or
 - (ii) is accompanied at all times by a person who satisfies the requirements of 2.1.7(b)(i).
- 2.1.8 The Responsible Person must ensure that a natural person who is in the presence of a security enhanced source other than for the purposes of dealing with the source:

³ For example, fixed, mobile and portable sources may need to be treated differently to ensure the security objectives are achieved whilst still allowing the sources to be used as intended.

- (a) for fixed or mobile sources, or portable sources in storage:
 - (i) has undergone an identity check in accordance with the requirements specified in Schedule E1; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.1.8(a)(i); or
 - (iii) is subject to rigorous personnel surveillance at all times.
- (b) for portable sources which are not in storage:
 - (i) has undergone a security background check in accordance with the requirements specified in Schedule E2; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.1.8(b)(i).

Compliance with Code and Source Security Plan

2.1.9 The Responsible Person dealing with a security enhanced source must comply with this Code and the Source Security Plan formulated in relation to that source under 2.1 and endorsed by an assessor accredited for this purpose by the regulatory authority.

Awareness of Threat Level

2.1.10 The Responsible Person dealing with a security enhanced source must update the security arrangements for the source in accordance with the source security plan when advised by the police or the regulatory authority of a change in the threat level for a radiological attack.

Transfer and Disposal of Security Enhanced Source

2.1.11 The Responsible Person dealing with a security enhanced source must not transfer the ownership of the source without the prior written approval of the regulatory authority in the jurisdiction of origin.

2.1.12 The Responsible Person dealing with a security enhanced source must not dispose of the source without the prior written approval of the regulatory authority.

2.2 RESPONSIBILITIES OF SERVICE PROVIDERS

2.2.1 Upon completion of a technical service, the Responsible Person must ensure that the security measures associated with a security enhanced source (that may have been temporarily disabled in order to perform the service) have been re-enabled or, if they are not able to be re-enabled, the Responsible Person must follow the course of action required by the Source Security Plan in the event that security features are not able to be re-enabled.

2.3 RESPONSIBILITIES OF PERSONS

2.3.1 The following conditions apply to all persons irrespective of their association to the Responsible Person.

- 2.3.2 A person, other than the Responsible Person, who deals with a security enhanced source, must comply with this Code and the Source Security Plan formulated in relation to that source under 2.1 and endorsed by an assessor accredited for this purpose by the regulatory authority.
- 2.3.3 A natural person, other than the Responsible Person, must not transport a security enhanced source unless the person has a legitimate reason for transporting the source and has undergone a security background check in accordance with the requirements specified in Schedule E2. Responsibility for ensuring that the person has undergone a security background check is to be borne by the Responsible Person.
- 2.3.4 Notwithstanding the transport measures in 2.3.3, a natural person, other than the Responsible Person, must not deal with a security enhanced source unless the person has a legitimate reason for dealing with the source and:
- (a) for fixed or mobile sources:
 - (i) has undergone an identity check in accordance with the requirements specified in Schedule E1; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.3.4(a)(i);
 - (b) for portable sources:
 - (i) has undergone a security background check in accordance with the requirements specified in Schedule E2; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.3.4(b)(i).
- 2.3.5 A natural person, other than the Responsible Person, must not be in the presence of a security enhanced source for purposes other than dealing with the source unless the person:
- (a) for fixed or mobile sources, or portable sources in storage:
 - (i) has undergone an identity check in accordance with the requirements specified in Schedule E1; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.3.5(a)(i); or
 - (iii) is subject to rigorous personnel surveillance at all times.
 - (b) for portable sources which are not in storage:
 - (i) has undergone a security background check in accordance with the requirements specified in Schedule E2; or
 - (ii) is accompanied at all times by a natural person who satisfies the requirements of 2.3.5(b)(i).
- 2.3.6 A person must not interfere with, remove, alter, damage or render ineffective, any security measures provided to secure a radioactive source except for legitimate source removal, transport or technical

service as covered in the Source Security Plan or Source Transport Security Plan.

- 2.3.7 A person must not abandon a radioactive source without lawful excuse.
- 2.3.8 When a Category 1 or 2 source is to be transferred between jurisdictions, the intended recipient must ensure that the regulatory authority in the jurisdiction in which the recipient resides has approved the transfer of the source.

3. Use of Security Enhanced Source – Physical Security Measures

3.1 USE OF A SECURITY ENHANCED SOURCE

- 3.1.1 For the purposes of this Chapter, ‘use’ is taken to include:
- (a) the manufacture, possession, installation, operation, maintenance, repair, or disposal of a radioactive source but does not include transportation or storage; and
 - (b) brief intervals of time, as defined by the security plan, during breaks in the performance of any of the activities described in 3.1.1(a).

3.2 SECURITY OUTCOMES TO BE ACHIEVED BY RISK-BASED PHYSICAL SECURITY MEASURES

Category 1 Security Enhanced Source

- 3.2.1 When in use, a Category 1 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of the intrusion, and for a guard or police service to interrupt unauthorised removal of the source.

Category 2 Security Enhanced Source

- 3.2.2 When in use, a fixed or mobile Category 2 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of unauthorised access to the source.

Category 3 Security Enhanced Source

- 3.2.3 When in use, a fixed or mobile Category 3 security enhanced source must be protected by, at a minimum, physical security measures capable of preventing unauthorised access to the source by human force.

4. Storage of Radioactive Sources – Physical Security Measures

4.1 STORAGE OF A SECURITY ENHANCED SOURCE

4.1.1 For the purposes of this chapter, storage is taken to exclude brief intervals of time between periods of use (as the term is defined in Chapter 3).

4.2 SECURITY OUTCOMES TO BE ACHIEVED BY RISK-BASED PHYSICAL SECURITY MEASURES

Category 1 Security Enhanced Source

4.2.1 When being stored, a Category 1 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of the intrusion, and for a guard or police service to interrupt unauthorised removal of the source.

Category 2 Security Enhanced Source

4.2.2 When being stored, a Category 2 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of unauthorised access to the source location.

Category 3 Security Enhanced Source

4.2.3 When being stored, a Category 3 security enhanced source must be protected by, at a minimum, physical security measures capable of preventing unauthorised access to the source by human force.

5. Transport of Radioactive Sources – Physical Security Measures

5.1 SOURCE TRANSPORT SECURITY PLAN

5.1.1 The Responsible Person transporting a Category 1, 2 or 3 security enhanced source must ensure that:

- (a) a Source Transport Security Plan that demonstrates how the Responsible Person will satisfy the requirements of this Code in relation to the source and contains the information set out in paragraph A.2 of Schedule A is endorsed by an assessor accredited for this purpose by the regulatory authority of each jurisdiction in which the source will be transported;
- (b) where the Source Transport Security Plan specified in clause 5.1 relates to the shipment of:
 - (i) a Category 1 security enhanced source, the endorsed plan is provided to the regulatory authority at least 7 calendar days in advance of the proposed date of shipment; or
 - (ii) a Category 2 or 3 security enhanced source, the endorsed plan is provided to the regulatory authority, at least 7 calendar days in advance of the proposed date of the shipment or, if shipments are likely to occur on a frequent basis, the first occasion a shipment occurs;
- (c) in the event that there is a change in the environment provided for in the Source Transport Security Plan - including new credible threat information - such that the Source Security Plan is no longer current, the Responsible Person must
 - (i) submit a revised Source Transport Security Plan for approval in accordance with 5.1.1(a); and
 - (ii) provide the endorsed revised plan to the regulatory authority in accordance with 5.1.1(b).

5.2 SECURITY OUTCOMES TO BE ACHIEVED BY RISK-BASED PHYSICAL SECURITY MEASURES

Category 1 Security Enhanced Source

5.2.1 When being transported, a Category 1 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of the intrusion, and for a guard or police service to interrupt unauthorised access to the source.

Category 2 Security Enhanced Source

5.2.2 When being transported, a Category 2 security enhanced source must be protected by, at a minimum, physical security measures capable of providing sufficient delay to allow immediate detection and assessment of unauthorised access to the source.

Category 3 Security Enhanced Source

5.2.3 When being transported, a Category 3 security enhanced source must be protected by, at a minimum, physical security measures capable of preventing unauthorised access to the source by human force.

5.3 COMPLIANCE WITH CODE AND SOURCE TRANSPORT SECURITY PLAN

5.3.1 Prior to the shipment occurring, the Source Transport Security Plan formulated and submitted to the regulatory authority under 5.1 must be endorsed by an assessor accredited for this purpose by the regulatory authority.

5.3.2 The Responsible Person transporting a Category 1, 2 or 3 security enhanced source must comply with the Source Transport Security Plan formulated in relation to that source under 5.1 and endorsed by an assessor accredited for this purpose by the regulatory authority.

5.3.3 A person, other than the Responsible Person, transporting a Category 1, 2 or 3 security enhanced source must comply with the Source Transport Security Plan formulated in relation to that source under 5.1 and endorsed by an assessor accredited for this purpose by the regulatory authority.

6. Procedural Security Measures

6.1 SECURITY OUTCOMES TO BE ACHIEVED BY RISK-BASED PROCEDURAL SECURITY MEASURES

Category 1 Security Enhanced Source

- 6.1.1 When the threat level is low, very low or negligible, the Responsible Person must ensure that the Category 1 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 2 column 2 of Table D.1.
- 6.1.2 When the threat level is medium, the Responsible Person must ensure that the Category 1 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 2, column 3 of Table D.1.
- 6.1.3 When the threat level is high or extreme, the Responsible Person must ensure that the Category 1 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 2, column 4 of Table D.1.
- 6.1.4 The Responsible Person must ensure that following an escalation of the threat level, the outcomes are able to be escalated to those corresponding to the next highest threat level within the time specified in the security plan and likewise thereafter.

Category 2 Security Enhanced Source

- 6.1.5 When the threat level is low, very low or negligible, the Responsible Person must ensure that the Category 2 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in column row 3, column 2 of Table D.1.
- 6.1.6 When the threat level is medium, the Responsible Person must ensure that the Category 2 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 3, column 3 of Table D.1.
- 6.1.7 When the threat level is high or extreme, the Responsible Person must ensure that the Category 2 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 3, column 4 of Table D.1.
- 6.1.8 The Responsible Person must ensure that following an escalation of the threat level, the outcomes are able to be escalated to those corresponding to the next highest threat level within the time specified in the security plan and likewise thereafter.

Category 3 Security Enhanced Source

- 6.1.9 When the threat level is low, very low or negligible, the Responsible Person must ensure that the Category 3 security enhanced source is

- protected by actions commensurate with the security outcomes achieved by the measures in row 4, column 2 of Table D.1.
- 6.1.10 When the threat level is medium, the Responsible Person must ensure that the Category 3 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 4, column 3 of Table D.1.
- 6.1.11 When the threat level is high or extreme, the Responsible Person must ensure that the Category 3 security enhanced source is protected by actions commensurate with the security outcomes achieved by the measures in row 4, column 4 of Table D.1.
- 6.1.12 The Responsible Person must ensure that following an escalation of the threat level, the outcomes are able to be escalated to those corresponding to the next highest threat level within the time specified in the security plan and likewise thereafter.

7. Security Management

7.1 NOTIFICATION OF A SECURITY BREACH

7.1.1 In the event of a security breach, the Responsible Person dealing with a radioactive source must:

(a) in the event that the security breach is

- (i) detectable theft;
- (ii) unexplained loss;
- (iii) unauthorised damage;
- (iv) unauthorised access; or
- (v) unauthorised transfer,

notify:

- (i) the local police service; and immediately thereafter,
- (ii) the regulatory authority

that a security breach has occurred and provide, as a minimum, the following information:

- (i) circumstances of the security breach;
- (ii) steps taken or proposed to be taken to rectify the breach;
- (iii) if a radioactive source is lost or stolen, any information that may assist in the recovery of the source; or

(b) in the event of any other security breach notify

- (i) the regulatory authority; and immediately thereafter,
- (ii) the local police service;

that a security breach has occurred and provide, as a minimum, the following information:

- (iii) circumstances of the security breach;
- (iv) steps taken or proposed to be taken to rectify the breach.

7.1.2 The Responsible Person must submit a written report of the incident containing the information described in 7.1.1 to the regulatory authority within 7 days of the date of the notification pursuant to 7.1.1.

7.1.3 Persons that deal with the radioactive source should be alert to suspicious behaviour in relation to not only the radioactive source and the asset in which it is housed but also the immediate environs. Such suspicious behaviour must be reported to the local police service and the regulatory authority.

7.2 ACCOUNTANCY AND RECORDS

7.2.1 Each Responsible Person dealing with a radioactive source must, at all times, be able to account for the whereabouts of that source.

- 7.2.2 The Responsible Person dealing with a security enhanced source, other than to perform a technical service involving a source located on the premises of another Responsible Person, must maintain records for that source that:
- (a) detail the whereabouts, serial number or identification number of the radioactive source;
 - (b) include a copy of the radioactive source certificate or other certification;
 - (c) detail the physical and chemical composition of the isotope in the source;
 - (d) detail the construction details and type of radioactive source;
 - (e) detail the activity and date of measurement of the activity of the radioactive source;
 - (f) detail the import, export, transfer, disposal or change in location (within or between premises controlled by the Responsible Person) of the radioactive source in the previous twelve months; and
 - (g) detail authorisations to deal with the radioactive source from the regulatory authority.

Schedule A

Security Plans

A1 SOURCE SECURITY PLAN

- A1.1 A Source Security Plan for a security enhanced source must include:
- (a) a description of the source including details such as isotope, activity and date of measurement, serial number and physical and chemical form;
 - (b) a description of the radiation practice for which the source is used and the categorisation of the source calculated in accordance with the methodology set out in Schedule B;
 - (c) a description of the specific location of the source in the building or facility where it is used or stored;
 - (d) a plan of the building or facility in which the source is used or stored including the physical security measures used to protect the source and a definition of the secure area for the purposes of Schedule D;
 - (e) allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
 - (f) a description of the specific security concerns to be addressed, for example theft or sabotage, or mechanical or electronic failure of a physical security measure;
 - (g) a description of the physical security measures that will be used to address the security concerns and meet the requirements of the Code;
 - (h) a description of the procedural security measures that will be used to address the security concerns and meet the requirements of the Code including:
 - (i) access control
 - (ii) key control
 - (iii) CCTV surveillance
 - (iv) personal surveillance
 - (v) identity checks and security background checks of personnel
 - (vi) inventories and records related to the management of sources
 - (vii) information security
 - (viii) procedures to be followed before, during and after a technical service
 - (ix) contingency and security response arrangements including notification of security breach
 - (x) security education and awareness
 - (xi) actions to be taken in the event of a change in threat level
 - (i) arrangements for review and revision of the Source Security Plan, including maximum time between reviews.

A2 SOURCE TRANSPORT SECURITY PLAN

- A2.1 A Source Transport Security Plan for a security enhanced source must include:
- (a) a description of the source to be transported including: isotope, activity (including date of measurement), physical and chemical form, serial number, transport packaging and the categorisation of the source calculated in accordance with the methodology set out in Schedule B;
 - (b) a statement of the purpose or reason for which the source is being transported;
 - (c) a description of the conveyance in which the source will be transported and the arrangements for securing the shipment during trans-shipment or other stops en route;
 - (d) allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
 - (e) the name, address and business and after hours contact details for the consignor, consignee, carrier and, where used, guard or police service;
 - (f) a description of the specific security concerns to be addressed, for example theft or sabotage, or mechanical or electronic failure of a physical security measure;
 - (g) a description of the physical security measures that will be used to address the security concerns and meet the requirements of the Code;
 - (h) a description of the procedural security measures that will be used to address the security concerns and meet the requirements of the Code including:
 - (i) arrangements for notifying, as deemed appropriate, local police service or the regulatory authority of each jurisdiction in which the source will be transported
 - (ii) contingency or emergency procedures for vehicle accidents or breakdown and including, for Category 1 sources, a planned principal route and an alternative route
 - (iii) security response arrangements including notification of security breach
 - (iv) security briefing for persons involved in transporting the source including nature of the threat, threat level and contingency and security response arrangements
 - (v) identity checks and security background checks of personnel
 - (vi) information security
 - (vii) means of communication between parties involved in transporting the source
 - (viii) actions to be taken in the event of a change in threat level;
 - (i) arrangements for review and revision of the Source Transport Security Plan, including maximum time between reviews.

Schedule B

Categorisation of a Radioactive Source or Aggregation of Radioactive Sources

B1 CATEGORISATION OF A RADIOACTIVE SOURCE

B1.1 The Code has been developed on the basis that security requirements should apply in a graded manner, that is, the stringency of the security measures should be proportional to the risk of the source or aggregation of sources being acquired and the consequences of malicious use. Using a risk methodology that draws on the IAEA's *Categorization of Radioactive Sources Safety Guide*⁴, IAEA Safety Standard Series No. RS-G-1.9, the Code categorised sources into 5 categories and sets security requirements for each category.

B1.2 In determining the appropriate category for a radioactive source, or aggregation of radioactive sources:

- (a) The categorisation for a single radioactive source is to be assigned the value in column 1 of Table B.1, based on the calculated value of activity ratio in column 2 of Table B.1, where the relevant D value for the radioactive source is determined from Table B.2.
- (b) Where there is an aggregation of radioactive sources of the same radionuclide, the aggregated ratio A/D must be calculated by dividing the summed activities of the radionuclide by the appropriate D value determined from Table B.2 using the equation:

$$\text{Aggregate } A/D = \sum_i A_i / D$$

The calculated ratio A/D is then compared with the ratios A/D given in Table B.1, thus allowing the set of sources to be categorised on the basis of activity.

- (c) Where there is an aggregation of radioactive sources with various radionuclides, the aggregated ratio A/D must be calculated separately for each radionuclide as detailed in B1.2(b) above. Then the sum of the ratios A/D must be determined using the equation:

$$\text{Aggregate } (A/D) = \sum_i A_{i,1} / D_1 + \sum_i A_{i,2} / D_2 + \dots \dots + \sum_i A_{i,n} / D_n$$

Where $A_{i,n}$ = activity of each individual source i of radionuclide n ;

$$D_n = D \text{ value for radionuclide } n.$$

The aggregated ratio A/D is then compared with the ratios A/D given in Table B.1, thus allowing the set of sources to be categorised on the basis of the sum of the aggregated ratios A/D for each radionuclide.

B1.3 Within any practice there may be a number of distinct sub-practices which a security enhanced source may be associated with from time to time. One example is storage versus use. These sub-practices must be considered separately for security purposes because the categorisation of sources when in storage might be different from that when they are in use. This means that the physical security requirements for sources in storage might be different from those required when they are in use.

⁴ This document is available on the internet at web address:
http://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf

Table B.1 Categorisation of Sources by Activity Ratio

Category	Activity ratio (A/D)^a
1	$A/D \geq 1000$
2	$1000 > A/D \geq 10$
3	$10 > A/D \geq 1$
4	$1 > A/D \geq 0.01$
5	$0.01 > A/D > \text{Exempt}^b/D$

a. Where:

- A is the total activity of a specific radioactive source, or aggregation of radioactive sources, containing a particular radioactive isotope, in units of gigabecquerel (GBq); and
- D is the value specified in Column 2 of Table B.2, in units of GBq.

The D-value for the specific radionuclide corresponds to the activity level at which the radioactive source is considered to be a Dangerous Source. The ratio of the activity in the radioactive source to the corresponding D-value for the radionuclide in the source (A/D), determines the category of the source.

b. Exempt quantities are given in Schedule 4 of the *National Directory for Radiation Protection*.

Table B.2 – Activity for a Dangerous Source (D-value)^a

Column 1	Column 2
Radionuclide	D-value Activity Level (GBq)
americium-241	60
americium-241/beryllium	60
cadmium-109	2×10^4
caesium-137	100
californium-252	20
cobalt-57	700
cobalt-60	30
curium-244	50
gadolinium-153	1×10^3
germanium-68	700
gold-198	200
iodine-125	200
iodine-131	200
iridium-192	80
iron-55	8×10^5
krypton-85	3×10^4
molybdenum-99	300
nickel-63	6×10^4
palladium-103	9×10^4
phosphorus-32	1×10^4
plutonium-238	60
plutonium-239/beryllium	60
polonium-210	60
promethium-147	4×10^4
radium-226	40
ruthenium-106 (rhodium-106)	300
selenium-75	200
strontium-90 (yttrium-90)	1×10^3
technetium-99m	700
thallium-204	2×10^4
thulium-170	2×10^4
tritium (H-3)	2×10^6
ytterbium-169	300

^a. If an isotope is not mentioned in this table, contact the regulatory authority for the relevant D value.

Schedule C

Threat Level

C1 DESCRIPTION

C1.1 The threat level is an indicator of the likelihood of a perceived perpetrator to acquire radioactive sources for the purposes of malicious use in Australia. Threat levels are set by the Australian Government’s National Threat Assessment Centre in relation to specific people, places, events, sectors and interests. Local threat levels may also be informed by intelligence gathered at the State and Territory level. Responsible Persons will be informed of an escalation subject to jurisdictional arrangements. Procedural security measures for protecting a security enhanced source escalate in accordance with the threat level.

C1.2 The threat levels are as specified in Table C.1.

Table C.1 Threat Levels

Threat Levels
Extreme
High
Medium
Low
Very Low
Negligible

Schedule D

Procedural and Administrative Security Requirements

Table D.1 Scalability of Procedural and Administrative Security Requirements with threat level for a Security Enhanced Source

Source Category	Threat Level			
	Low, Very Low or Negligible	Medium	High or Extreme	
1	A,D	A,B,D,E	A,B,C,D,E	Row 1
2	A	A,B,D,E	A,B,C,D,E	Row 2
3	A	A,B	A,B,C,D,E	Row 3
				Row 4

Column 1 Column 2 Column 3 Column 4

Legend

Group	Security action
A	Annual review of Source Security Plan and Source Security Transport Plans
	Annual review of intrusion detection, event assessment and communication measures
	Annual review of access controls and physical barriers
	Annual review of staff access requirements
	Event specific review of staff access
	Staff induction security awareness briefing
	Annual staff security awareness briefing
	Event specific staff security awareness briefing
	Annual audit of all sources
	Monthly accounting or check to confirm presence of the source
Visitors to be signed in and escorted while present inside the secure area defined in the Source Security Plan	
B	Weekly accounting or check to confirm presence of the source
C	Visitors to be refused entry to the inside of the secure area defined in the Source Security Plan, unless authorised by the regulatory authority, police service, ambulance service or fire brigade
	Goods deliveries to be dispatched and received off-site with movement of goods only to be undertaken by personnel satisfying 2.1.8 or 2.1.9
	Half yearly staff security awareness briefing
	Daily accounting or check to confirm presence of the source
D	Annual exercising of guard force or police service response arrangements
E	Half yearly review of staff access

Schedule E

Identity Check and Security Background Check

E1 PROCEDURES FOR PERFORMING AN IDENTITY CHECK

- E1.1 The identity of each person who is intended to have access to a security enhanced source must be verified by:
- (a) provision of original identity documents in accordance with E1.2;
 - (b) confirmation of employment history, education and personal referees; and
 - (c) to the extent necessary, obtaining independent information to corroborate that provided by the person, for example, seek references not supplied by the person.
- E1.2 Each person who has access to a security enhanced source must provide one original document from Table E.1 and one original document from Table E.2.

Table E.1 Primary Identity Document

An Australian full birth certificate showing parental details.
An overseas birth certificate showing parental details provided a passport or an official Australian travel document is also shown.
A current Document of Identity issued by the Australian Passport Office.
A current Australian passport or one that expired within the last two years.
A current foreign passport.
An Australian naturalisation or citizenship document or immigration papers issued by the Commonwealth Department of Immigration and Multicultural and Indigenous Affairs.
A current driver's photo licence from an Australian State or Territory or one that expired within the last two years.

Table E.2 Secondary Identity Document

A current Medicare card, Pensioner Concession Card, Department of Veterans' Affairs entitlement card or any other current entitlement card issued by the Commonwealth Government.
A current credit card, that shows the persons name, or account card from a bank, building society or credit union, or a passbook or account statement up to one year old.
An armed services discharge document up to two years old.
A current student identity card or a certificate or statement of enrolment up to two years old from an educational institution.
An electoral enrolment card or other evidence of enrolment not more than two years old.
A telephone, gas or electricity bill up to one year old.
A water rates, council rates or land valuation notice up to two years old.

E2 SECURITY BACKGROUND CHECK

- E2.1 In addition to the identity check detailed in E1, the person must have a security background check. The security background check includes a security assessment in respect of a person, issued by ASIO, and criminal history checks by the Australian Federal Police, and all State and Territory police services.

References

- Australian Government Attorney-General's Department (2005) *Commonwealth Protective Security Manual (PSM)*.
- Australian Government (2004) *Security Equipment Catalogue*. Security Construction and Equipment Committee (SCEC).
- Australian Radiation Protection and Nuclear Safety Agency (2004) *National Directory for Radiation Protection, Edition 1.0*, Radiation Protection Series No. 6.
- International Atomic Energy Agency (2005) *Categorization of Radioactive Sources Safety Guide*⁵, IAEA Safety Standard Series No. RS-G-1.9.
- Standards Australia AS 2201.1-1998 (1998) *Intruder Alarm Systems. Part 1: Systems Installed in Client's Premises*.
- Standards Australia AS/NZS 3749.1:2003 – Intruder Alarm Systems – Road Vehicles.
- Standards Australia and Standards New Zealand AS/NZS 4360:2004 (2004) *Risk Management*.
- Standards Australia and Standards New Zealand HB 4360:2004 (2004) *Risk Management Guidelines: Companion to AS/NZS 4360:2004*.

⁵ This document is available on the internet at web address:
http://www-pub.iaea.org/MTCD/publications/PDF/Pub1227_web.pdf

Glossary

Activity

the measure of quantity of radioactive materials, except when used in the term 'human activity'.

Activity, A , is a measure of the amount of a radioactive material given by:

$$A = \frac{dN}{dt}$$

where dN is the expectation value of the number of spontaneous nuclear transitions which take place in the time interval dt .

The unit of activity is s^{-1} with the special name becquerel (Bq).

Aggregation of radioactive sources

radioactive sources are considered to be aggregated if breaching a common physical security barrier (e.g., a locked door at the entrance to a storage room) would allow access to the sources or devices containing the sources.

Code

the *Code of Practice for the Security of Radioactive Sources*.

Code of Practice for the Security of Radioactive Sources

the document of that title published by the CEO of the Australian Radiation Protection and Nuclear Safety Agency in 2006.

Deal with

includes to use, manufacture, store, sell, receive, possess, install, operate, maintain, repair, dispose of or transport a radioactive source.

Dealing

includes to use, manufacture, store, sell, receive, possess, install, operate, maintain, repair, dispose of or transport a radioactive source.

Fixed radioactive source

a radioactive source located in a device or container which, in the normal course of its use, is permanently secured to a structure and intended to be immobile.

Human force

any force that can be exerted by a natural person including by using tools, but excluding the use of power tools.

Mobile radioactive source

a radioactive source located in a device or container which, in its normal course of use, is intended to be capable of being moved in a limited way from place to place, for example a large machine on wheels designed to be able to be repositioned by a person within a room in a facility.

Physical security measure

a tangible barrier intended to deter and delay unauthorised access to a radioactive source.

Portable radioactive source

a radioactive source located in a device or container which, in its normal course of use, is intended to be carried or moved with ease from place to place.

Radioactive source

a sealed radioactive source.

Radioactive material

material that undergoes spontaneous transformation of its nucleus with the emission of ionizing radiation and which, for the purposes of this Code, exceeds a prescribed concentration or activity as determined by the relevant regulatory authority.

Regulatory authority

an entity or organisation or a system of entities or organisations designated by the government of a State, Territory or the Commonwealth as having legal authority for exercising regulatory control with respect to radioactive sources, including issuing authorisations, and thereby regulating one or more aspects of the safety or security of radioactive sources.

Responsible person

a natural person or a body corporate who deals with a sealed radioactive source and either:

- (a) has the direct management responsibility for the security of the source or the premises; or
- (b) has the overall control over who may use the source or premises.

Rigorous personnel surveillance

recorded surveillance by:

- (a) a monitored closed circuit television (CCTV) camera; or
- (b) an event actuated camera; and
- (c) anti stay behind detection and alarm.

Routine maintenance

work intended by the manufacturer of the radioactive source or equipment housing the source to be performed by the Responsible Person in order to keep the source or equipment in adequate operating order.

Sealed radioactive source

radioactive material that is permanently sealed in a capsule or closely bonded in a solid form.

Secure

free from:

- (a) detectable theft;
- (b) unexplained loss;
- (c) unauthorised damage;
- (d) unauthorised access; and
- (e) unauthorised transfer.

Security

measures to prevent unauthorised access or damage to, and loss, theft or unauthorised transfer of, a radioactive source.

Security breach

a breach of a security measure specified in the Source Security Plan or Source Transport Security Plan or the requirements of this Code.

Security enhanced source

a radioactive source or aggregation of radioactive sources assigned the Category 1, 2 or 3 when using the methodology set out in Schedule B.

Security measure

a stratagem or engineered device which is put in place as an element of a security system.

Security plan

a plan that has been put in place to effectively minimise all security risks relevant to the dealing with a Category 1, 2 or 3 radioactive source.

Security risk

risk of:

- (a) theft of a radioactive source;
- (b) unexplained loss of a radioactive source;
- (c) unauthorised damage;
- (d) unauthorised access; and
- (e) unauthorised transfer.

Security system

a combination of security measures described in a security plan which ensures the security of a security enhanced source.

Service provider

a person who is, or who employs, a service technician.

Service technician

a person, being a natural person, who repairs, performs maintenance, other than routine maintenance, or calibrates a radioactive source or a housing that contains a radioactive source.

Technical service

the performance of maintenance by a service technician, other than routine maintenance, on the equipment housing a security enhanced source or any other security measures in place to secure a security enhanced source.

Unauthorised access

in the context of this Code, means physical access gained to a security enhanced source without the lawful consent of a person entitled to grant such consent at law.

Unexplained loss

any documented loss that cannot be explained.

Unsealed radioactive source

a radioactive substance that is not a sealed radioactive source.

Annex 1

ARPANSA Radiation Protection Series Publications

ARPANSA has taken over responsibility for the administration of the former NHMRC Radiation Health Series of publications and for the codes developed under the *Environment Protection (Nuclear Codes) Act 1978*. The publications are being progressively reviewed and republished as part of the *Radiation Protection Series*.

All publications listed below are available in electronic format, and can be downloaded free of charge by visiting ARPANSA's website at www.arpansa.gov.au/codes.htm.

Radiation Protection Series publications are available for purchase directly from ARPANSA. Further information can be obtained by telephoning ARPANSA on 1800 022 333 (freecall within Australia) or (03) 9433 2211.

- RPS 1. Recommendations for Limiting Exposure to Ionizing Radiation (1995) and National Standard for Limiting Occupational Exposure to Ionizing Radiation (republished 2002)
- RPS 2. Code of Practice for the Safe Transport of Radioactive Material (2001)
- RPS 3. Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz (2002)
- RPS 4. Recommendations for the Discharge of Patients Undergoing Treatment with Radioactive Substances (2002)
- RPS 5. Code of Practice and Safety Guide for Portable Density/Moisture Gauges Containing Radioactive Sources (2004)
- RPS 6. National Directory for Radiation Protection – Edition 1.0 (2004)
- RPS 7. Recommendations for Intervention in Emergency situations Involving Radiation Exposure (2004)
- RPS 8. Code of Practice for the Exposure of Humans to Ionizing Radiation for Medical Research Purposes (2005)
- RPS 9. Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005)
- RPS 10. Code of Practice and Safety Guide for Radiation Protection in Dentistry (2005)
- RPS 11. Code of Practice for the Security of Radioactive Sources (2007)
- RPS 12. Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation (2006)
- RPS 13. Code of Practice and Safety Guide for Safe Use of Fixed Radiation Gauges (2007)

The Nuclear Codes Series have now all been republished. Those publications from the NHMRC Radiation Health Series that are still current are:

RADIATION HEALTH SERIES

- RHS 3. Code of practice for the safe use of ionizing radiation in veterinary radiology: Parts 1 and 2 (1982)
- RHS 8. Code of nursing practice for staff exposed to ionizing radiation (1984)

- RHS 9. Code of practice for protection against ionizing radiation emitted from X-ray analysis equipment (1984)
- RHS 10. Code of practice for safe use of ionizing radiation in veterinary radiology: part 3-radiotherapy (1984)
- RHS 13. Code of practice for the disposal of radioactive wastes by the user (1985)
- RHS 14. Recommendations for minimising radiological hazards to patients (1985)
- RHS 15. Code of practice for the safe use of microwave diathermy units (1985)
- RHS 16. Code of practice for the safe use of short wave (radiofrequency) diathermy units (1985)
- RHS 18. Code of practice for the safe handling of corpses containing radioactive materials (1986)
- RHS 19. Code of practice for the safe use of ionizing radiation in secondary schools (1986)
- RHS 21. Revised statement on cabinet X-ray equipment for examination of letters, packages, baggage, freight and other articles for security, quality control and other purposes (1987)
- RHS 22. Statement on enclosed X-ray equipment for special applications (1987)
- RHS 23. Code of practice for the control and safe handling of radioactive sources used for therapeutic purposes (1988)
- RHS 24. Code of practice for the design and safe operation of non-medical irradiation facilities (1988)
- RHS 25. Recommendations for ionization chamber smoke detectors for commercial and industrial fire protection systems (1988)
- RHS 28. Code of practice for the safe use of sealed radioactive sources in bore-hole logging (1989)
- RHS 30. Interim guidelines on limits of exposure to 50/60Hz electric and magnetic fields (1989)
- RHS 31. Code of practice for the safe use of industrial radiography equipment (1989)
- RHS 34. Safety guidelines for magnetic resonance diagnostic facilities (1991)
- RHS 35. Code of practice for the near-surface disposal of radioactive waste in Australia (1992)
- RHS 36. Code of practice for the safe use of lasers in schools (1995)
- RHS 37. Code of practice for the safe use of lasers in the entertainment industry (1995)
- RHS 38. Recommended limits on radioactive contamination on surfaces in laboratories (1995)

Annex 2

Regulatory Authorities

Where advice or assistance is required from the relevant regulatory authority for radiation protection, it may be obtained from the following officers:

COMMONWEALTH, STATE / TERRITORY	CONTACT
Commonwealth	CEO ARPANSA PO Box 655 Miranda NSW 1490 Email: info@arpansa.gov.au Tel: (02) 9541 8333 Fax: (02) 9541 8348
New South Wales	Director Radiation Control Department of Environment and Conservation PO Box A290 Sydney South NSW 1232 Email: radiation@environment.nsw.gov.au Tel: (02) 9995 5000 Fax: (02) 9995 6603
Queensland	Director, Radiation Health Unit Department of Health 450 Gregory Terrace Fortitude Valley QLD 4006 Email: radiation_health@health.qld.gov.au Tel: (07) 3406 8000 Fax: (07) 3406 8030
South Australia	Director, Radiation Protection Division Environment Protection Authority PO Box 721 Kent Town SA 5071 Email: radiationprotection@epa.sa.gov.au Tel: (08) 8130 0700 Fax: (08) 8130 0777
Tasmania	Senior Health Physicist Health Physics Branch Department of Health and Human Services GPO Box 125B Hobart TAS 7001 Email: health.physics@dhhs.tas.gov.au Tel: (03) 6222 7256 Fax: (03) 6222 7257
Victoria	Manager, Radiation Safety Section Department of Human Services GPO Box 4057 Melbourne VIC 3001 Email: radiation.safety@dhs.vic.gov.au Tel: 1300 767 469 Fax: 1300 769 274
Western Australia	Secretary, Radiological Council Locked Bag 2006 PO Nedlands WA 6009 Email: radiation.health@health.wa.gov.au Tel: (08) 9346 2260 Fax: (08) 9381 1423
Australian Capital Territory	Manager Radiation Safety Radiation Safety Section ACT Health Locked Bag 5 Weston Creek ACT 2611 Email: radiation.safety@act.gov.au Tel: (02) 6207 6946 Fax: (02) 6207 6966
Northern Territory	Manager Radiation Protection Radiation Protection Section Department of Health and Community Services GPO Box 40596 Casuarina NT 0811 Email: envirohealth@nt.gov.au Tel: (08) 8922 7152 Fax: (08) 8922 7334

Please note: This table was correct at the time of printing but is subject to change from time to time. For the most up-to-date list, the reader is advised to consult the ARPANSA web site (www.arpansa.gov.au).

For after hours emergencies only, the police will provide the appropriate emergency contact number.

Contributors to Drafting and Review

WORKING GROUP

Mr David Tredinnick	(Cwlth), Policy and Source Security Unit, ARPANSA (convenor)
Mr Peter Colgan	(Cwlth), formerly with the Policy and Source Security Unit, ARPANSA (former convenor)
Mr Simon Critchley	(Qld), Radiation Health Unit, Qld Department of Health
Mr Keith Dessent	(Cwlth), Standards Development & Committee Support Section, ARPANSA
Mr Peter Ellis	(Cwlth), Policy and Source Security Unit, ARPANSA
Dr Ross McKerracher	(Cwlth), Policy and Source Security Unit, ARPANSA and Department of the Prime Minister and Cabinet
Mr Graeme Palmer	(SA), Radiation Protection Division, Environment Protection Authority
Mr Len Potapof	(NSW), Hazardous Materials and Radiation Section, Department of Environment and Conservation
Mr Brent Rogers	(NSW), formerly with the Hazardous Materials and Radiation Section, Department of Environment and Conservation
Dr Stephen Solomon	(Cwlth), Health Physics, ARPANSA

PERSONS CONTRIBUTING TO THE DEVELOPMENT OF THE PUBLICATION

Mr Cris Ardouin	(NZ), National Radiation Laboratory
Mr Tony Cotterill	(NZ), National Radiation Laboratory
Mr Alex Kalaiziovski	(NSW), Hazardous Materials and Radiation Section, Department of Environment and Conservation
Mr Wayne Randle	(NZ), National Radiation Laboratory

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