

CODE OF PRACTICE

Safe Transport of Radioactive Material

Radiation Protection Series Publication No. 2

Public Comment Version: April 2001

Radiation Protection Series

The ***Radiation Protection Series*** is published by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to promote practices that protect human health and the environment from the possible harmful effects of radiation. ARPANSA is assisted in this task by its Radiation Health and Safety Advisory Council, which reviews the publication program for the ***Series*** and endorses documents for publication, and by its 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 in dealings involving exposure to radiation. Requirements are expressed in 'must' statements.

Recommendations provide guidance on fundamental principles for radiation protection. They are written in an explanatory and non-regulatory style and describe the basic concepts and objectives of best international practice. Where there are related **Radiation Protection Standards** and **Codes of Practice**, they are based on the fundamental principles in the **Recommendations**.

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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This publication was approved by the Radiation Health Committee on
dd mmmm yyyy, and endorsed for publication by the
Radiation Health & Safety Advisory Council on dd mmmm yyyy

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The mission of ARPANSA is to provide the scientific expertise and infrastructure necessary to support the objective of the ARPANS Act — to protect the health and safety of people, and to protect the environment, from the harmful effects of radiation.

Produced by the Australian Radiation Protection and Nuclear Safety Agency

Publications and design by

Foreword

The regulation of the transport of radioactive material in Australia has for many years been based on international requirements published by the International Atomic Energy Agency (IAEA). The regulatory frameworks of the Commonwealth, State and Territory jurisdictions currently adopt the *Code of Practice for the Safe Transport of Radioactive Substances 1990*, which was formulated under the provisions of the *Environment Protection (Nuclear Codes) Act 1978*. This Code in turn adopted the International Atomic Energy Agency's *Regulations for the Safe Transport of Radioactive Material, 1985 edition, incorporating the 1988 Supplement*.

In 1996 the IAEA published *Regulations for the Safe Transport of Radioactive Material*, which was republished in 2000 as the *1996 edition (revised)*. In publishing the 1996 regulations, IAEA recommended that “adoption of these revised Regulations occur within a period of five years from their publication to achieve worldwide harmonization of their application.”

With the formation of ARPANSA in February 1999, provision was made for the repeal of the *Environment Protection (Nuclear Codes) Act*, and Australia's system of developing radiation protection guidance is now through the Radiation Health Committee, which was established under the ARPANS Act 1998. The Radiation Health Committee has agreed to the development of a Radiation Protection Series of publications, which will be formed by progressively reviewing existing publications in the NHMRC Radiation Health Series and publications formulated under the *Environment Protection (Nuclear Codes) Act*, along with consideration of areas for new publications.

This Code of Practice has been developed by a working group of the Radiation Health Committee, which has reviewed the IAEA 1996 Regulations in order to replace the 1990 Code. The Code establishes requirements for adoption by Commonwealth, State and Territory jurisdictions that will provide a system for the safe transport of radioactive material by road, rail and inland waterways in Australia. The main relevant changes from the 1990 Code include the introduction of Type C containers for transport of high activity sources by aircraft, the use of exemption limits from the *IAEA International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Sources*, a requirement for radiation protection programs, and revisions to the requirements for fissile materials. Harmonization with international requirements is an important consideration to ensure that Australia can export and import radioactive material safely and with a minimum of additional local requirements intervening.

However in reviewing the changes in the IAEA 1996 Regulations, it has been found that they are deficient in regard to the definition of radioactive material. This particularly applies to the exemption levels set for material that contains low levels of naturally occurring radionuclides (eg. washed sands and tailings from alumina mining). As a result this Code includes a qualification to paragraph 107(e) of the IAEA Regulations. Without this qualification, the Code would have to be applied to enormous quantities of material that present

a very low hazard. The qualification is based on IAEA advice produced since the 1996 Regulations to clarify this issue, and is considered to provide an appropriate balance between the radiological protection concerns and the practical inconvenience of regulating large quantities of material with a naturally occurring low activity concentration.

The Code was released for a public comment period from 28 April 2001 to 28 May 2001 along with a Regulatory Impact Statement, to meet the requirements of the *Principles and Guidelines for National Standard-setting and Regulatory Action by Ministerial Councils and Standard-setting Bodies* published by the Council of Australian Governments in November 1997. The comments received were reviewed by the working group, and the final document was adopted by the Radiation Health Committee on, and endorsed by the Radiation Health and Safety Advisory Council on

The Code will be revised and updated from time to time to ensure that it continues to provide the highest standards of protection.

[signature]

John Loy
CEO of ARPANSA

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Contributors to Drafting and Review

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1. Introduction

1.1 CITATION

This Code of Practice may be cited as the *Code of Practice for the Safe Transport of Radioactive Material (2001)*.

1.2 BACKGROUND

This Code of Practice replaces the *Code of Practice for the Safe Transport of Radioactive Substances 1990*, published under the Environment Protection (Nuclear Codes) Act 1978. It adopts the International Atomic Energy Agency *Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised)* (No. TS-R-1 (ST-1, Revised)) as published in 2000.

The transport of radioactive material by any person, organisation or government must comply with the radiation safety legislation of the State, Territory or Commonwealth jurisdiction through which the radioactive material is transported.

1.3 PURPOSE

This Code of Practice is intended to establish uniform requirements for the transport of radioactive material for adoption by all State, Territory and Commonwealth jurisdictions in Australia.

1.4 SCOPE

This Code of Practice applies to the transport of radioactive material by road, rail and waterways under the jurisdiction of States and Territories in Australia.

1.5 STRUCTURE

Section 2 includes modifications for Australian circumstances to the International Atomic Energy Agency *Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised)* (No. TS-R-1 (ST-1, Revised)), which are adopted as Schedule 1.

The terms used in this Code are defined in the Glossary.

Schedule 2 contains the dose limits adopted in the National Health and Medical Research Council (NHMRC) *Recommendations for limiting exposure to ionizing radiation (1995)*.

Annex 1 contains a list of Australian Competent Authorities for the Transport of Radioactive Material. Annex 2 contains a list of ARPANSA Radiation Protection Series Publications.

2. Modifications to International Regulations

- 2.1 This Code of Practice does not apply to the transport of radioactive material by road, rail and watercraft in a particular State, Territory or Commonwealth jurisdiction until the earlier of:
- (a) the date on which the *Code of Practice for the Safe Transport of Radioactive Substances (1990)* is deemed not to apply in that particular State, Territory or Commonwealth jurisdiction; or
 - (b) 1 July 2001.
- 2.2 Subject to the provisions of 2.1, a person must not transport radioactive material by road, rail or intrastate watercraft unless that person does so in accordance with the International Regulations as modified and clarified by Clauses 2.3-2.12 of this Code of Practice.
- 2.3 Transport of radioactive material by air must be in accordance with the *Civil Aviation Act 1988*.
- 2.4 Interstate and international transport of radioactive material by sea must be in accordance with the *Navigation Act 1912*.
- 2.5 The “relevant transport regulations for dangerous goods” referred to in paragraph 109 of the International Regulations are the regulations of Australian States, Territories and the Commonwealth for the transport of dangerous goods by road and rail which are based upon the Australian Code for the Transport of Dangerous Goods by Road and Rail, Sixth Edition, 1998 (ADG Code).
- 2.6 In the event of a conflict between the requirements of the ADG Code or of the regulations of the Australian States, Territories and the Commonwealth for the transport of dangerous goods by road and rail and this Code, the provisions of this Code prevail.
- 2.7 In addition to the exemptions specified in paragraphs 107 (a)-(e) of the International Regulations, this Code does not apply to:
- natural material and ores containing naturally occurring radionuclides, which have been processed, where the physical or chemical processing was not for the purpose of extracting radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in paras 401-406.
- 2.8 Paragraph 304 of the International Regulations is replaced by:
- The relevant *competent authority* may impose requirements to ensure that radiation protection measures comply with the recommendations of the NHMRC *Recommendations for limiting exposure to ionizing*

radiation (1995), the dose limits from which are reproduced in Schedule 2.

- 2.9 In paragraph 306 of the International Regulations, the word “dose” is to be read as “effective dose”.
- 2.10 The paragraphs of the International Regulations to be complied with by consignors are:
109, 303, 306-307, 310, 312, 401-419, 501-511, 514, 515(a)-(c), 516-561, 566-567, 570-572, 574-575, 601-682, 701-737, 801-803, 805(a)-(b), 806-807, 809-810, 812-813, 815-820, 822, 824-825.
- 2.11 The paragraphs of the International Regulations to be complied with by carriers are:
109, 301-303, 305-310, 312, 504-507, 509-514, 523, 533(c), 525-527, 540-543, 546-547, 562-578, 582, 625-628.
- 2.12 Competent Authorities are:
- (i) for the purpose of this Code of Practice, those listed in Table 1 of Annex A, as amended from time to time; or
 - (ii) for the purpose of transport by sea or air, those listed in Table 2 of Annex A, as amended from time to time.

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Schedule 1

The International Regulations (to be inserted here)

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Schedule 2

DOSE LIMITS

Application	Dose Limit ¹	
	Occupational	Public
Effective dose	20 mSv per year, Averaged over a period of 5 consecutive calendar years ^{2,3}	1 mSv in a year ⁴
Annual equivalent dose in:		
the lens of the eye	150 mSv	15 mSv
the skin ⁵	500 mSv	50 mSv
the hands and feet	500 mSv	-

1. The limits shall apply to the sum of the relevant doses from external exposure in the specified period and the 50-year committed dose (to age 70 years for children) from intakes in the same period.
2. With the further provision that the effective dose shall not exceed 50 mSv in any single year. In addition, when a pregnancy is declared by a female employee, the embryo or foetus should be afforded the same level of protection as required for members of the public.
3. When, in exceptional circumstances, a temporary change in the dose limitation requirements is approved by the appropriate authority, one only of the following conditions shall apply: (a) the effective dose limit shall not exceed 50 mSv per year for the period, which shall not exceed 5 years, for which the temporary change is approved, or (b) the period for which the 20 mSv per year average applies shall not exceed 10 consecutive years and the effective dose shall not exceed 50 mSv in any single year.
4. In special circumstances, a higher value of effective dose could be allowed in a single year, provided that the average over 5 years does not exceed 1 mSv per year.
5. The equivalent dose limit for the skin applies to the dose averaged over any 1 cm² area of skin, regardless of the total area exposed.

NOTE: The above dose limits table is directly extracted from the NHMRC's *Recommendations for limiting exposure to ionizing radiation (1995)*, however the Radiation Health Committee now advises that the exceptional circumstances clause in note 3 of the table is not recommended for use in Australia.

References

International Atomic Energy Agency 2000, *Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised) (No. TS-R-1 (ST-1, Revised))*, IAEA, Vienna.

National Health & Medical Research Council 1995, Recommendations for limiting exposure to ionizing radiation (1995), and National Occupational Health and Safety Commission 1995, National standard for limiting occupational exposure to ionizing radiation (1995), Radiation Health Series No. 39, AGPS, Canberra.

Glossary

the International Regulations

means the International Atomic Energy Agency 2000, *Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised) (No. TS-R-1 (ST-1, Revised))* as reproduced in Schedule 1.

Other meanings in this Code are those defined in the International Regulations.

Annex A

Table 1: List of Australian Competent Authorities for the Purpose of this Code

COMMONWEALTH STATE / TERRITORY	CONTACT	COMPETENT AUTHORITY
Commonwealth	Director, Regulatory Branch ARPANSA PO Box 655 Miranda NSW 1490 Tel: (02) 9545 8333 Fax: (02) 9545 8348 Email: arpansa@health.gov.au	Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)
New South Wales	Director, Radiation Control Section Environment Protection Authority P.O. Box A290 Sydney South NSW 1232 Tel: (02) 9995 5000 Fax: (02) 9995 5925 Email: info@epa.nsw.gov.au	NSW Environment Protection Authority
Queensland	Director, Radiation Health Department of Health 450 Gregory Terrace Fortitude Valley QLD 4006 Tel: (07) 3406 8000 Fax: (07) 3406 8030 Email: radiation_health@health.qld.gov.au	Queensland Department of Health
South Australia	Director, Radiation Protection Branch Department of Human Services PO Box 6 Rundle Mall Adelaide SA 5000 Tel: (08) 8226 6520 Fax: (08) 8226 6255 Email: radiation@dhs.sa.gov.au	Minister for Human Services
Tasmania	Senior Health Physicist Department of Health & Human Services GPO Box 125B Hobart TAS 7001 Tel: (03) 6222 7256 Fax: (03) 6222 7257 Email: barbara.shields@dchs.tas.gov.au	Director of Public Health
Victoria	Chief Radiation Officer, Radiation Safety Unit Department of Human Services GPO Box 4057 Melbourne VIC 3001 Tel: (03) 9637 4167 Fax: (03) 9637 4508 Email: radiation.safety@dhs.vic.gov.au	Chief General Manager, Department of Human Services
Western Australia	Secretary Radiological Council of Western Australia Locked Bag 2006 Nedlands WA 6009 Tel: (08) 9346 2260 Fax: (08) 9381 1423 Email: radiation.health@health.wa.gov.au	Radiological Council of Western Australia
Australian Capital Territory	Secretary, ACT Radiation Council Department of Health and Community Care GPO Box 825 Canberra ACT 2601 Tel: (02) 6207 6946 Fax: (02) 6207 6966 Email: radiation.safety@act.gov.au	Australian Capital Territory Radiation Council
Northern Territory	Director, Radiation Health Branch GPO Box 40596 Casuarina NT 0811 Tel: (08) 8999 2983 Fax: (08) 8999 2700 Email:	Territory Health Services

Table 2: List of Other Australian Competent Authorities for the Transport of Radioactive Material by Sea or Air

MODE OF TRANSPORT	CONTACT	COMPETENT AUTHORITY
Sea (International and interstate)	Manager, Survey Operations Ship & Personnel Safety Services Australian Maritime Safety Authority GPO Box 2181 Tel: (02) 6279 5048 Canberra ACT 2601 Fax: (02) 6279 5058 Email: mocbrship@mail.amsa.gov.au	Australian Maritime Safety Authority
Air Transport	Director, Aviation Safety Civil Aviation Safety Authority GPO Box 2005 Tel: (02) 6217 1754 Canberra ACT 2601 Fax: (02) 6217 1757 Email: peter.fletcher@casa.gov.au	Civil Aviation Safety Authority

Annex B

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*. Current publications in the *Radiation Protection Series* are:

- RPS 1. (reserved)
RPS 2 Code of Practice for the Safe Transport of Radioactive Material (2001)

Those publications from the NHMRC Radiation Health Series and the Environment Protection (Nuclear Codes) Act Series that are still current are:

RADIATION HEALTH SERIES

- RHS 2. Code of practice for the design of laboratories using radioactive substances for medical purposes (1980)
RHS 3. Code of practice for the safe use of ionizing radiation in veterinary radiology: Parts 1 and 2 (1982)
RHS 4. Code of practice for the safe use of radiation gauges (1982)
RHS 5. Recommendations relating to the discharge of patients undergoing treatment with radioactive substances (1983)
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 11. Code of practice for the safe use of soil density and moisture gauges containing radioactive sources (1984)
RHS 12. Administration of ionizing radiation to human subjects in medical research (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 17. Procedure for testing microwave leakage from microwave ovens (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 20. Code of practice for radiation protection in dentistry (1987)
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 26. Policy on stable iodine prophylaxis following nuclear reactor accidents (1989)
- RHS 28. Code of practice for the safe use of sealed radioactive sources in borehole logging (1989)
- RHS 29. Occupational standard for exposure to ultraviolet radiation (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 32. Intervention in emergency situations involving radiation exposure (1990)
- 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)
- RHS 39. Recommendations for limiting exposure to ionizing radiation (1995) and National standard for limiting occupational exposure to ionizing radiation

ENVIRONMENT PROTECTION (NUCLEAR CODES) ACT SERIES

Code of Practice on the Management of Radioactive Wastes from the Mining and Milling of Radioactive Ores 1982

Code of Practice on Radiation Protection in the Mining and Milling of Radioactive Ores 1987

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