

Code of Practice for the Security of Radioactive Material

2015

Draft for consultation

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Contents

Introduction	1
Purpose and scope	1
Principles	1
International instruments	1
Accountabilities	2
Definitions	3
Material in use or storage	5
Material in transport	8
Appendix I: Minimum security plan requirements	10
Consultation submission	11
Consultation questions	12

Introduction

Purpose and scope

1. The code applies to the secure use, storage and transport of *radioactive material* and *nuclear material*. Compliance satisfies security requirements in the Radiation Protection Regulations 1982 (the Regulations) including those relating to safe care (r 9(1)), storage (r 9(4)), transport (r 3), tamper prevention (r 11(1)(f)), loss prevention (r 11(1)(g)), post-loss (r 11(2)) and safekeeping (r 12(1)). The code therefore has general application but licences and consents issued under the Radiation Protection Act 1965 (the Act) may also expressly require compliance.
2. Requirements in related areas such as occupational safety and resource management must be satisfied separately. The code focuses on security but also recognises that society benefits from the safe use of *radioactive material*. Security and safety must therefore be managed in a complementary way to ensure the continued safe use of *radioactive material* by authorised persons.

Principles

3. The code sets out the requirements to prevent, detect and respond to malicious acts involving *radioactive material* and *nuclear material* in use, storage and in transport. A threshold is applied for determining which packages or material need to be protected beyond prudent management practice. Security requirements are applied on a graded approach that takes account of an assessment of the threat, the nature and relative attractiveness of the *radioactive material* or *nuclear material* and the potential consequences of unauthorised removal or sabotage. The requisite level of security is achieved through a combination of deterrence, detection, delay, response, and security management.

International instruments

4. The code supports New Zealand's implementation of the Convention on the Physical Protection of Nuclear Material, the International Convention for the Suppression of Acts of Nuclear Terrorism and the Code of Conduct on the Safety and Security of Radioactive Sources.

Accountabilities

5. Office of Radiation Safety (ORS) – the regulatory body that administers the Act and Regulations and issues this code. ORS is responsible for implementing and maintaining a national regime for the security of *radioactive material* and *nuclear material*.

Office of Radiation Safety	03 974 2358 (Phone), 03 372 1015 (Fax)
PO Box 3877	021 393 632 (Emergency Response)
Christchurch 8140	orsenquiries@moh.govt.nz
6. Managing Entity – the legal entity that manages or controls *radioactive material* or *nuclear material*. This could for example be an individual, company, partnership, crown research institute, district health board or university. The Managing Entity is responsible for security of material in its management or control and must either (1) appoint a licensed person to manage the safe care of material and provide all necessary equipment, material and support to that person to satisfy security requirements or (2) in cases where no such licensee is appointed, store the material to the satisfaction of ORS. In either case the requirements of this code must be satisfied.
7. Licensee – the person who is licensed under section 13 of the Act and appointed to manage the safe care of material under regulation 9(1) of the Regulations. This person must comply with the conditions in licences issued by ORS and with the security requirements in the Regulations. This person is entitled to require full assistance from the Managing Entity to fulfil these security requirements.
8. Consignor – the legal entity that prepares a package for transport.
9. Carrier – the legal entity that undertakes carriage of packages by any means of transport. This includes carriers for hire or reward (e.g. commercial transport companies) and those who carry on their own account (e.g. industrial radiographers).
10. Consignee – the legal entity entitled to take delivery of the package.

Definitions

11. Defined terms are displayed in *italics* and have the following meanings:
 - 11.1 A2-value – radioactivity level set for packages in the *IAEA Transport Regulations*.
 - 11.2 Basic Security Package – package that is not an *Enhanced Security Package*, containing material exceeding the excepted package quantity for non-special form contents but excluding LSA-1 and SCO-1 (as all of those terms are defined in the *IAEA Transport Regulations*).
 - 11.3 Category A Material – (1) *radioactive material* with an activity equal to or greater than 1000 times its *D-value* or (2) *nuclear material* containing 2 kg unirradiated *plutonium*, 5 kg unirradiated uranium enriched to 20% uranium-235 or more, or 2 kg unirradiated uranium-233 or (3) any other such material as advised by ORS.
 - 11.4 Category B Material – material that is not *Category A Material* and is (1) *radioactive material* with an activity equal to or greater than 10 times its *D-value*, or (2) *nuclear material* containing 500 g unirradiated *plutonium*, 1 kg unirradiated uranium enriched to 20% uranium-235 or more, 10 kg unirradiated uranium enriched to 10% but less than 20% uranium-235, 500 g unirradiated uranium-233, or irradiated fuel in the form of depleted or natural uranium, thorium or low enriched fuel or (3) any other such material as advised by ORS.
 - 11.5 Category C Material – material that is not *Category B Material* and is (1) *radioactive material* with an activity equal to or greater than its *D-value*, or (2) *nuclear material* containing 15 g unirradiated *plutonium*, 15 g unirradiated uranium enriched to 20% uranium-235 or more, 1 kg unirradiated uranium enriched to 10% but less than 20% uranium-235, 10 kg unirradiated uranium enriched above natural but less than 10% uranium-235 or 15 g unirradiated uranium-233 or (3) any other such material as advised by ORS.
 - 11.6 D-value – activity set by the International Atomic Energy Agency relating to the danger value of individual radionuclides.
 - 11.7 Enhanced Security Package – package containing sealed *radioactive material* with an activity equal to or greater than 10 times its *D-value*, or unsealed *radioactive material* with an activity equal to or greater than 3,000 times its *A2-value*.
 - 11.8 IAEA Transport Regulations – the current version for the time being of the Regulations for the Safe Transport of Radioactive Material issued by the International Atomic Energy Agency (SSR-6).
 - 11.9 National threat level – the assessed level of threat that is developed nationally and advised to operators by ORS.
 - 11.10 Nuclear material – *plutonium*; uranium-233; uranium enriched in the isotope 235 or 233; uranium containing the mixture of isotopes as occurring in nature other than in the form of ore or ore-residue; any material containing one or more of the foregoing.
 - 11.11 Plutonium – All plutonium except that with isotopic concentration exceeding 80% in plutonium-238.

- 11.12 **Radioactive material** – material that spontaneously emits ionising radiation with an activity and activity concentration exceeding the levels set out in Schedule 1 Radiation Protection Regulations 1982.
- 11.13 **Security plan** – written plan maintained by the operator that (1) describes the security approach and system to protect the material and (2) complies with the minimum requirements in Appendix I.
- 11.14 **Unacceptable radiological consequence** – an effective dose exceeding 100 mSv received by any member of the public in the first 7 days following an event.
- 11.15 **Vulnerability assessment** – evaluation and documentation of the features and effectiveness of the overall security system at a particular facility.

Material in use or storage

12. For material in use or storage the Licensee (if appointed under regulation 9(1) of the Regulations) or, in any other case, the Managing Entity must –
 - 12.1 determine whether the material is *Category A Material*, *Category B Material*, or *Category C Material*, and in all cases comply with the relevant security obligations in clauses 13 to 16; and
 - 12.2 for *Category A Material*, *Category B Material* and *Category C Material* –
 - (a) carry out an initial *vulnerability assessment* and review this annually; and
 - (b) maintain and regularly review a *security plan*; and
 - 12.3 for material that is *nuclear material* determine whether an act of sabotage could result in an *unacceptable radiological consequence* and if so comply with any further ORS requirements; and
 - 12.4 if advised of a change in *national threat level* by ORS, immediately –
 - (a) for *Category A Material*, *Category B Material* and *Category C Material* – carry out a vulnerability assessment to ensure that the relevant requirements in clauses 13.1, 14.1, or 15.1 are satisfied having regard to the new national threat level; and update the *security plan* and implement any new requirements arising from that assessment; and
 - (b) comply with any further ORS requirements; and
 - 12.5 if clauses 12.1 to 12.4 result in inconsistent requirements then comply with the most stringent of those requirements.
13. For *Category A Material* in use or storage the security obligations are to –
 - 13.1 take all reasonable steps to prevent the unauthorised removal of the material; and
 - 13.2 without limiting the general nature of clause 13.1 –
 - (a) deter adversaries from attempting a malicious act; and
 - (b) implement delay mechanisms, including at least two layers of barriers, sufficient for response personnel to interrupt any unauthorised removal; and
 - (c) ensure trustworthiness of authorised personnel; and
 - (d) provide at least two forms of access control to restrict access to the secured area to authorised personnel; and
 - (e) identify and protect sensitive information; and
 - (f) enable immediate verification of unauthorised removal of material; and
 - (g) immediately detect unauthorised access to the secured area; and
 - (h) immediately detect any attempted unauthorised removal of the material; and
 - (i) immediately assess and verify detections under paragraphs (g) and (h); and

- 13.3 upon verification of an attempted unauthorised access to the secured area –
- (a) immediately respond with sufficient resources to interrupt and prevent the removal of the material; and
 - (b) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (c) notify the incident to ORS; and
- 13.4 upon verification of an attempted unauthorised removal –
- (a) immediately respond with sufficient resources to interrupt and prevent the removal of the material; and
 - (b) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (c) take all reasonable steps to locate and recover the material; and
 - (d) notify the incident to ORS.
14. For *Category B Material* in use or storage the security obligations are to –
- 14.1 take all reasonable steps to minimise the likelihood of unauthorised removal of the material; and
- 14.2 without limiting the general nature of clause 14.1 –
- (a) deter adversaries from attempting a malicious act; and
 - (b) implement delay mechanisms, including at least two barriers, sufficient for response personnel to minimise the likelihood of unauthorised removal; and
 - (c) ensure trustworthiness of authorised personnel; and
 - (d) provide at least one form of access control to restrict access to the secured area to authorised personnel; and
 - (e) identify and protect sensitive information; and
 - (f) enable immediate verification of unauthorised removal of material; and
 - (g) immediately detect unauthorised access to the secured area; and
 - (h) detect any attempted unauthorised removal of the material; and
 - (i) immediately assess and verify detections under paragraphs (g) and (h); and
- 14.3 upon verification of an attempted unauthorised access to the secured area –
- (a) immediately respond with sufficient resources to interrupt and prevent the removal of the material; and
 - (b) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (c) notify the incident to ORS; and
- 14.4 upon verification of an attempted unauthorised removal –
- (a) immediately initiate a response with sufficient resources to interrupt the removal of the material; and
 - (b) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and

- (c) take all reasonable steps to locate and recover the material; and
 - (d) notify the incident to ORS.
- 15. For *Category C Material* in use or storage the security obligations are to –
 - 15.1 take all reasonable steps to reduce the likelihood of unauthorised removal of the material; and
 - 15.2 without limiting the general nature of clause 15.1 –
 - (a) deter adversaries from attempting a malicious act; and
 - (b) implement delay mechanisms, including at least one barrier, sufficient to reduce the likelihood of unauthorised removal; and
 - (c) ensure trustworthiness of authorised personnel; and
 - (d) provide at least one form of access control to restrict access to the secured area to authorised personnel; and
 - (e) identify and protect sensitive information; and
 - (f) enable immediate verification of unauthorised removal of material; and
 - (g) immediately detect unauthorised access to the secured area; and
 - (h) detect any unauthorised removal of the material; and
 - (i) immediately assess and verify detections under paragraphs (g) and (h); and
 - 15.3 upon verification of unauthorised removal –
 - (a) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (b) take all reasonable steps to locate and recover the material; and
 - (c) notify the incident to ORS.
- 16. For material in use or storage that is not *Category A Material*, *Category B Material* or *Category C Material*, the security obligations are to –
 - 16.1 adopt prudent management practice to secure the material against unauthorised removal; and
 - 16.2 upon verification of unauthorised removal –
 - (a) take all reasonable steps to locate and recover the material; and
 - (b) notify the incident to ORS.

Material in transport

17. For material in transport the Consignor, Carrier and Consignee must cooperate to –
 - 17.1 in all cases comply with the general security obligations in clause 18; and
 - 17.2 determine whether the material to be transported requires additional security measures as a *Basic Security Package* or an *Enhanced Security Package*, and comply with the relevant security obligations in clauses 19 and 20; and
 - 17.3 comply with the relevant obligations in clauses 13 to 16 while material is temporarily stored in transit; and
 - 17.4 for material that is *nuclear material* determine whether an act of sabotage could result in an *unacceptable radiological consequence* and, if so, comply with any further ORS requirements; and
 - 17.5 comply with such further requirements imposed by ORS in response to any increase in the *national threat level*; and
 - 17.6 if clauses 17.1 to 17.5 result in inconsistent requirements then comply with the most stringent of those requirements.
18. The general security obligations are to –
 - 18.1 apply the security measures ordinarily applied to a commercial shipment; and
 - 18.2 upon verification of unauthorised removal –
 - (a) take all reasonable steps to locate and recover the material; and
 - (b) notify the incident to ORS.
19. For *Enhanced Security Packages* in transport the security obligations are to –
 - 19.1 take all reasonable steps to prevent the material from being susceptible to malicious acts; and
 - 19.2 without limiting the general nature of clause 19.1 –
 - (a) maintain and regularly review a *security plan*; and
 - (b) ensure transport crew carry positive means of identification; and
 - (c) retain material in the control of trusted and trained personnel; and
 - (d) securely stow packages; and
 - (e) transfer material only to authorised persons; and
 - (f) immediately detect any attempted unauthorised removal of material; and
 - 19.3 upon verification of an attempted unauthorised removal –
 - (a) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (b) take all reasonable steps to locate and recover the material; and
 - (c) notify the incident to ORS.

20. For *Basic Security Packages* in transport the security obligations are to –
- 20.1 take all reasonable steps to minimise the likelihood of the material being susceptible to malicious acts; and
- 20.2 without limiting the general nature of clause 20.1 –
- (a) ensure transport crew carry positive means of identification; and
 - (b) retain material in the control of trusted and trained personnel; and
 - (c) securely stow packages; and
 - (d) transfer material only to authorised persons; and
 - (e) detect unauthorised removal of material; and
- 20.3 upon verification of unauthorised removal –
- (a) immediately notify the national radiation incident officer (021 393 632) and NZ Police and comply with their instructions; and
 - (b) take all reasonable steps to locate and recover the material; and
 - (c) notify the incident to ORS.

Appendix I: Minimum security plan requirements

Description of the material, its categorisation and use.

Description of the building and/or facility in which the material is located.

Areas (if any) of the building or facility that are accessible to the public.

For material in use or storage the security measures implemented to satisfy –

- the requirements in clause 13 (*Category A Material*)
- the requirements in clause 14 (*Category B Material*)
- the requirements in clause 15 (*Category C Material*).

For material in transport the security measures implemented to satisfy the requirements in clause 19 (*Enhanced Security Packages*).

Contingency Plans for a range of events including suspected or malicious acts, public demonstrations with potential to threaten security of *radioactive material* or *nuclear material* and the intrusion into the secured area by unauthorised personnel.

Procedures to address increases in the *national threat level*.

Procedures for evaluation and testing of *security plans*.

Documented details of *vulnerability assessments* carried out.

Security Event Reporting System.

Details of *security plan* reviews including dates, personnel and outcome.

Consultation submission

Details

Name and designation: _____

Company organisation name
and address: _____

Contact phone number and
email address: _____

Confidentiality

Please keep my comments confidential: *(reasons including identity of specific comments if applicable)* Yes

This request can only be actioned if your reasons satisfy Official Information Act criteria

Please remove my name from all documents published on the Ministry's website: Yes

Please remove my name from the list of submissions published on the Ministry's website: Yes

Additional information

I am, or I represent, an organisation that is based in:

New Zealand Australia Other *(please specify)*:

I am, or I represent, a: *(tick all that apply)*

Industrial radiographer Transport operator Professional body
 Radiation facility (health) Other industry organisation Government
 Radiation facility (other) Institution (e.g. university, hospital) Member of the public
 Other *(please specify)*:

Please return this form to:

Email: <mailto:orsenquiries@moh.govt.nz> (including 'Security Code' in the subject line)

or post: Office of Radiation Safety, PO Box 3877, Christchurch 8140

Consultation questions

The Office of Radiation Safety is seeking comments on:

Purpose and scope

- 1 Are there risks associated with the legitimate societal use of radioactive material that have not been identified in this Code of Practice?

Yes

No

If yes, please describe these and provide your suggestions on how these can be managed.

Accountabilities

- 2 Are the obligations of the Managing Entity and Licensee appropriate and adequately described in this Code?

Yes

No

Please note any comments below.

Please include additional pages if necessary.

Definitions

3 Are the definitions appropriate and comprehensive?

Yes

No

Please note any comments below.

Security requirements

4 a. Do you understand how the security requirements apply to your role?

Yes

No

b. Are the security requirements described in this code adequate to manage the identified risks?

Yes

No

Please note any comments below.

Please include any additional pages if necessary.

Additional comments

- 5 a. Was the information appropriately presented?
- Yes
- No
- b. Was the information easy to find?
- Yes
- No
- c. Are there any changes you would like to suggest?
- Yes
- No
- d. Are there circumstances that are not included in this Code but should be? If yes, please provide more details.
- Yes
- No
- e. Is the information easily understood?
- Yes
- No
- f. Is there any other information or subject that should be included in this Code?
- Yes
- No

Please note any comments below.

Please include any additional pages if necessary.