



INSTRUCTIONS AND GUIDELINES

Radiation Safety Management Plan

January 2012

**This Instruction & Guideline refers to Practice Statement No:
PS2009/22 – Inspection and Examination of Sea Cargo**

Published date: 27 March 2012
Availability: Internal
Subject: Radiation Safety Management Plan
Purpose: To provide safety information to Customs and Border Protection operators of x-ray and sealed radioactive active devices at Container and Cargo Examination Facilities.
Owners: National Director Cargo
Category: Operational
Contact: National ISO coordinator, Sea Cargo Improvement

The electronic version published on the intranet is the current Instruction and Guideline

Summary of main points

- Guide to safety requirements
- Guide to safety procedures

This Instruction and Guideline applies to staff in:

- Container Examination Facilities in Brisbane, Fremantle, Melbourne and Sydney
- Cargo Examination Facilities in Adelaide, Darwin, Launceston, Newcastle, Townsville

The Quality Management system is applied in Cargo Examination facilities in Launceston, Newcastle, Townsville and Darwin although these sites are not required to be certified

1. Introduction

This Radiation Safety Management Plan (RSMP) is intended to provide essential information to Customs and Border Protection personnel associated with operation of x-ray and equipment containing a sealed radioactive source at Container and Cargo Examination Facilities (CEFs).

Each CEF holds a facility licence issued by the Australian Radiation and Nuclear Safety Authority (ARPANSA) to operate container x-ray machines that are particle accelerators with a beam energy of more than 1 MeV.

The facility licence holder representative is Bill Eversham, Director Sea Cargo Improvement, Cargo Branch, Canberra.

Customs and Border Protection also holds a source licence issued by ARPANSA for the operation of equipment with output less than 1 MeV. Items at CEFs operated under this licence include:

- pallet and cabinet x-ray machines; and
- analytical devices with sealed radioactive sources such as itemisers, ionscans and radiation detectors.

The source licence holder representative is Nick Riley, Supervisor X-ray and Radiological Program, Detection and Identification Technology Branch, Canberra.

WHS considerations

Workplace safety is the responsibility of every Australian Customs and Border Protection Service (C&BPS) employee.

C&BPS officers working in the Sea Cargo Operations working environment are to wear WH&S issue personal protection equipment (eg: steel cap boots, high visibility vests etc) at all times.

Prior to commencing any examination, C&BPS officers must assess the working environment and circumstances of each individual tasking to identify factors which may impact on the officer's personal safety. C&BPS adopts the approach that all officers must apply the 'precautionary principle' where by if the composition of a chemical or substance under examination is uncertain then the chemical or substance is to be assumed as hazardous (appropriate PPE used) until confirmed as safe.

C&BPS officers should not rely solely on Customs import and associated documentation or declarations when determining the contents of a consignment. Physical deconstruction should not proceed until a full visual assessment of the whole consignment has been completed and where necessary safety issues have been mitigated.

C&BPS officers are to handle cargo according to safe lifting guidelines (*WH&S Hazard Instruction & Guideline – Manual Handling*) and use team lifting or mechanical devices to prevent injury.

C&BPS Supervisors and Managers are to ensure that sufficient First Aid trained officers are available in the workplace.

Comcare

All injuries or incidents are to be reported in the *Customs Managing People and Self Service (COMPASS)* system, to a Supervisor and to Comcare via the *Notification and Report of an Incident* form. The Regional HSR Co-ordinator should also be informed. Further reporting requirements can be found on the Comcare website

http://comcare.gov.au/safety_and_prevention/reporting_an_injury_or_illness/incident_notification

There are legal reporting timeframes when reporting to Comcare about instances of death, serious illness or injury, or a dangerous incident.

Notifiable workplace incidents are to be reported to Comcare via facsimile, telephone or on-line reporting. Timeframes are as follow:

| | |
|---------------------------|-----------|
| Death | Immediate |
| Serious Injury or Illness | Immediate |
| Dangerous Incident | Immediate |

Note – Failure to comply with the above stated reporting timeframes is a breach of Part 3 of the Health and Safety Act 2011(CTH).

All hazards are to be reported according to the Hazard Reporting process. Specifically, hazards are to be reported to an immediate Supervisor and the Regional HSR Co-ordinator on the *Hazard Report Form*, when the hazard cannot be immediately eliminated or when further action is required.

Customs Incident Reporting Centre (CIRC)

Any incidents that arise during an examination that have the capacity to interrupt or affect C&BPS business, including security incidents, must be reported to the Customs Incident Reporting centre on 1300 303 387 and followed up with on-line reporting.

COMPASS Reporting

Customs and Border Protection utilises COMPASS as its enterprise human resources system. As a function of COMPASS, employees/supervisors can lodge WHS incident notifications where there has been an injury, exposure to hazardous substances or a dangerous occurrence/near-miss (an incident where no injury was sustained).

Employee Assistance Provider (EAP)

If required the C&BPS Employee Assistance Provider, PPC Worldwide, is available to work with staff involved in a critical incident. Trained counsellors can be deployed to a workplace within 2 hours.

2. Regulatory and Licensing Requirements

2.1 ARPANSA

ARPANSA inspectors may conduct site audits to ensure compliance with the Australian Radiation Protection and Nuclear Safety Act 1998, the Australian Radiation Protection and Nuclear Safety Regulations 1999, relevant codes of practice, and any additional conditions mentioned in the relevant ARPANSA licence including:

- Application of effective safety controls and procedures;
- Maintenance performed by appropriately qualified persons;
- Appropriate training and maintenance of training records;
- Submission of quarterly reports;
- Possession of an up to date inventory of all controlled apparatus (source licence only); and
- An approved RSMP which must be reviewed annually.

2.2 Codes of Practice

2.2.1 Container X-rays

RHS 24 - *Code of practice for the design and safe operation of non-medical irradiation facilities (1988)* that establishes design and operation requirements for linear accelerators. It covers standards for safety features such as shielding, safety interlocks, keys, signage, alarms and warning signals.

2.2.2 Pallet and Cabinet X-rays

RHS 21 – *Revised statement on cabinet X-ray equipment for examination of letter, packages, baggage, freight and other articles for security, quality control and other purposes (1987)*

2.2.3 Itemisers, loniscans and radiation detectors

RHS 9 - *Protection Against Ionizing Radiation Emitted from X-ray Analysis Equipment (1984)* and *Australian Standard 2243.4 1998 Safety in Laboratories Part 4*

The ARPANSA website contains codes relevant to the operation of Customs and Border Protection's operation of X-rays and sealed radioactive devices:

www.arpansa.gov.au/Publications/codes/rhs.cfm

3. Radiation Safety

Australian Customs and Border Protection is aware of, and adheres to the underlying principle of minimising exposure to radiation through the ALARA principle that states that exposure to ionising radiation should be As Low As Reasonably Achievable. To compliment RHS 24, other safety features are in place:

3.1 Radiation Safety Officer (RSO)

Customs and Border Protection has contracted a consultancy to:

- Provide specialist advice when required, including advice in relation to incidents and accidents;
- Conduct Radiation Safety Awareness Officer (RSAO) training; and

- Conduct regular radiation safety surveys, including if and when the integrity of shielding is compromised, replacement of an x-ray tube, modification or reassembly of a shielding component, or significant movement or re-location of an x-ray machine.

To comply with licence requirements this consultancy is known as the “Radiation Safety Officer” or RSO. Contact details appear in Attachment A.

3.2 Radiation Safety Awareness Officers (RSAOs)

A number of Customs and Border Protection Officers at CEFs are trained by the RSO as RSAOs whose responsibilities may include:

- Routine and operational monitoring requirements of the low energy x-ray systems pallet and cabinet type x-ray systems;
- Identifying and reporting radiation incidents to CEF Supervisors, who will then advise the CEF Manager;
- Conducting induction training and awareness sessions;
- Conducting radiation detection procedures using radiation monitors; and
- Completing ARPANSA quarterly reporting.

3.3 Maintenance of Equipment

Contracts are in place to maintain x-ray and associated equipment at regular intervals and effect repairs when necessary.

Apparatus used by maintenance contractors to conduct radiation surveys must be calibrated and certified.

ARPANSA may inspect maintenance reports, calibration certificates, and the qualifications of maintenance personnel.

Contact details appear in Attachment A.

3.4 Quality Assurance

To ensure a high standard of quality control Customs and Border Protection uses a quality management system in accordance with certification under ISO 9001:2000 This entails detailed documentation of approved procedures, regular audits and reviews. Information regarding ISO certification is available at the CEF Intranet Webpage.

3.5 Site Induction

Visitors to CEFs and contractors must receive appropriate site induction. Refer to IsGs “Visitors to the CEF”.

3.6 Approved Exclusion Zones

In the event of scanning hall door failure at Container Examination Facilities, exclusion zones may be applied in accordance with approved specifications (Fremantle 11.4 m x 3.52 m; Melbourne, Sydney and Brisbane 6.7 m x 5.2 m).

The use of exclusion zones must be reported in ARPANSA quarterly reports.

3.7 Operator Training

Successful completion of the appropriate training course is required for operators of X-ray systems, detection and identification technologies and radiation detection and identification equipment. The corresponding Customs and Border Protection training modules are listed with the equipment types:

Note: Unit 1 - Radiation Safety and X-ray Awareness is a mandatory course for operators of all X-ray and radiation detection equipment.

3.7.1 Thermo RadEye Personal Radiation Detector (PRD) - Unit 6A National X-ray Education Program (NXEP)

3.7.2 SAIC GR135 Radiation Identifier - Unit 6B NXEP

3.7.3 Morpho Itemiser 3 - Itemiser 3 Operator, Itemiser 3 Maintenance, Itemiser 3 CATO

3.7.4 Smiths Detection Ionscan 500DT - Ionscan 500DT Operator, Ionscan 500DT CATO

3.7.5 Smiths Detection Sabre 400 - Sabre 400 Operator, Sabre 400 CATO

3.7.6 Cabinet X-rays - Unit 2A, Unit 2B, Unit 2C, Unit 2D, Unit 2E NXEP

3.7.7 Pallet X-rays - Unit 3B NXEP

3.7.8 Container X-rays - Unit 4A, Unit 4B NXEP

3.5.8 RSAO's must also complete:

- Unit 6A and 6B (radiation monitoring)
- Appropriate X-ray operator training

4. Dose Limits

The radiation dose limit for all Customs and Border Protection Officers and contractors is 1mSv in a year.

5. Radiation Accidents and Incidents

5.1 Accidents

Regulation 46 of the Australian Radiation Protection and Nuclear Safety Regulations 1999 defines an accident as any unintended or unexpected event when using controlled apparatus, controlled material or a controlled facility, that either leads to or has the potential to cause injury, damage or harm to any person or the environment.

Examples of types of incidents which would be rated as accidents in the Customs and Border Protection environment and must be reported to ARPANSA within 24 hours under regulation 46

1. An event that causes or may lead to radiation doses exceeding the statutory annual dose limit.
2. A package containing an unsealed source of more than 10,000 times the exemption level¹ is inappropriate, or is damaged during freight handling or transport in such a way that safety provisions are degraded.
3. Damage to, or malfunctioning of, a controlled apparatus or device containing controlled material where it is likely that a person could have received a dose of 5 mSv for occupationally exposed persons and 1 mSv in all other cases.

If an accident happens, the licence holder must take all reasonably practicable steps to control the accident and to minimise the consequences, including injury to any person and impact on the environment.

The licence holder must tell the ARPANSA CEO about the accident within 24 hours and provide a written report about the accident within 14 days. Go to the 'Accident Reporting' page of the ARPANSA website.

<http://www.arpansa.gov.au/Regulation/LicenceHolders/incident.cfm>

5.2 Abnormal events or incidents

Other abnormal events or incidents are those that have the potential to affect safety. These must be reported in the quarterly report to ARPANSA.

In the event of damage to an X-ray unit the operator must notify a supervisor. If the unit is seriously damaged it should be sealed in a plastic bag and the supervisor must notify the RSO and seek advice.

6. Emergency procedures

6.1 Exposure to Radiation

Radiation incidents include a person being exposed to ionising radiation, e.g. inside the scanning hall during a scan. If someone is exposed to radiation, follow emergency procedures:

- Immediately stop the x-ray system using an emergency stop,
- Use an appropriate radiation monitor to confirm the X-ray tube is powered down. (The RSO may be requested to carry out dose rate measurements as required.)

6.2 Detection of Radioactive materials

6.2.1 If radioactive materials are detected during examination, refer to the Radiation Detection Instruction and Guideline and the Radiological Hazards Instruction and Guideline.

6.2.2 In the event of damage to a package labelled as containing radioactive material or an illicit package containing radioactive material refer to the National CEF Instruction and Guideline on Radiation Detection.

6.2.3 If a leaking package is located, the RSO should be informed and any person who may have been exposed to or contaminated by radioactive material should be monitored and assessed. Initial decontamination can be carried out using cold soapy water (it should be noted that some medical radioisotopes are shipped with "dry ice" and condensation is common on these packages - this should not be confused with radioactive leakage).

6.3 Reporting Requirements

All radiation incidents must be reported to the relevant supervisor, WH&S Co-ordinator, RSAO and RSO. Managers are to report incidents to Sea Cargo Improvement section. Customs officers are to also follow reporting procedures in the "introduction" section of this document. Contractors are to report radiation WH&S incidents via a [paper incident report](#), available at the Staffing Branch intranet site. Please be sure to note the length

of time that possible exposure occurred, and, if relevant, the location of affected person/s within the scanning hall.

Related Policies and References

Practice Statements:

- Inspection and Examination of Sea Cargo
- Use of Operational x-ray and radiation detection/identification equipment

Other Instructions & Guidelines

- Instructions and Guidelines relating to CEF Operations
- Detection and Identification Technologies Instructions and Guidelines
- WH&S Instructions and Guidelines
- CEF Emergency and Evacuation Plans

Key Roles and Responsibilities

National ISO Coordinator, Sea Cargo Improvement, Canberra
CEF Managers

This RSMP is reviewed and updated by Sea Cargo Improvement, Technology and Enforcement Capabilities, and the Radiation Safety Awareness Officers (RSAOs), in conjunction with the Radiation Safety Officer (RSO). Review of this plan is conducted on an annual basis in accordance with Regulation 50 of the Australian Radiation Protection and Nuclear Safety Regulations 1999.

Copies of this document are controlled. Master copies of the document are on the Intranet. National ISO coordinator is responsible for version control.

Consultation

Internal

The following internal stakeholders have been consulted in the development of these Instructions and Guidelines.

- CEF Management and staff
- Equipment Operators
- ISO Coordinators
- Sea Cargo Improvement
- Technology and Enforcement Capabilities, Enforcement and Investigations

External

- Australian Radiation Services
- Australian Radiation Protection and Nuclear Safety Authority (ARPANSA)

Approval

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| Approved on | 16 March 2012 | |
| By | David Leonard A/g National Director Cargo Division | |
| Review Period | This National Guideline is to be formally reviewed annually by Sea Cargo Improvement | |

Attachment A - Contact list

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| APAC Security (AS&E Cabinet X-ray) | Head Office | 02 9972 4316 |
| ARPANSA Accident reporting | www.arpansa.gov.au http://www.arpansa.gov.au/Regulation/LicenceHolders/incident.cfm | |
| Operations Services Branch Head (business hours) | | 02 8541 8331 |
| 24 hour Radiation Emergency Coordination Centre (after hours) | | 03 9432 5384 |
| Australian Radiation Services (Radiation Safety Officer) | Head Office Simon Toomey Joe Young | 03 9877 4898 0427 545 074 03 9817 7565 0419 541 462 |
| Facility Licence Holder Representative | Bill Eversham | 02 6275 6938 |
| Source Licence Holder Representative | Nick Riley | 02 6275 6693 |
| L3 Communications (Pallet X-ray) | Head Office | 03 8645 4500 |
| Morpho Australasia (Itemisers) | | 1800 147 174 02 9844 6222 |
| Nuctech (Container X-ray) on site technicians | Head Office Charlie (Sydney) Brook (Melbourne) Donmas (Brisbane) Kevin (Fremantle) | 02 9662 2307 0432 193 333 0432 195 122 0432 195 133 0415 342 878 |
| Radiation Services Australia (Scanning Hall Doors - Melb, Syd, Bne) | Barry Delange Kevin Fitzsimmons | 02 9677 9888 02 6341 1955 |
| Rapiscan (Cabinet X-ray) | Head Office | 03 9929 4600 |
| Smiths Detection (Ionscans) | Head Office Service | 02 8338 9722 1800 559 729 |

State Health Authorities

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| ACT | www.health.act.gov.au | 02 6205 1700 |
| NSW | www.environment.nsw.gov.au/radiation/index.htm | 02 9995 5000 |
| NT | www.health.nt.gov.au | 08 8922 7152 |
| Qld | www.health.qld.gov.au/radiationhealth/ | 07 3328 9987 |
| SA | www.epa.sa.gov.au | 08 8204 2000 |
| Tas | www.dhhs.tas.gov.au/peh/radiation_protection | 03 6222 7256 |
| Vic | www.health.vic.gov.au/environment/radiation/ | 1300 767 469 |
| WA | www.radiologicalcouncil.wa.gov.au | 08 9346 2260 |