



Inspection report

Licence holder: Department of Agriculture, Water and the Environment, Australian Antarctic Division (AAD)	Licence number: S0055
Location inspected: Kingston, Tasmania	Date/s of inspection: 14 February 2020
	Report no: R20/01709

This inspection was conducted as part of ARPANSA’s baseline inspection program to assess compliance with the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act), the Australian Radiation Protection and Nuclear Safety Regulations 2018 (the Regulations), and conditions of the Source Licence S0055.

The scope of the inspection included an assessment of AAD’s performance at its Kingston, Tasmania, premises against the Source Performance Objectives and Criteria (POCs). The inspection consisted of a review of records, interviews, and a physical inspection of sources.

Background

The AAD, based in Kingston Tasmania, manages and administers Australia’s presence in the Australian Antarctic Territory and the Southern Ocean, along with the subantarctic territories of Heard Island and McDonald Islands and their adjacent waters. The AAD is responsible for leading, coordinating and delivering the Australian Antarctic program focused on conducting world-class science of critical national importance and global significance, which delivers on Australian Antarctic policy and operational priorities.

In achieving these goals, AAD uses sealed and unsealed radioactive sources, X-ray analysis equipment, UV apparatus and lasers as research tools. Consequently, AAD is licensed under section 33 of the *Australian Radiation Protection and Nuclear Safety Act 1998* to deal with controlled material and controlled apparatus for research at its various sites.

The main codes and standards applicable to these sources are those that appear in section 59 of the Regulations plus:

- Australian Standard Safety in Laboratories – Ionizing Radiations (2018) (AS 2243.4-2018) (the IR Standard)
- Radiation Protection Series No. 12 Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation (2006) (RPS12)
- Radiation Health Series 9 Code of practice for protection against ionizing radiation emitted from X-ray analysis equipment (1984) (RHS9)
- Australian/New Zealand Standard Safety in laboratories – Non-ionizing radiations – Electromagnetic, sound and ultrasound (2004) (AS/NZS 2243.5:2004) (the NIR Standard)

- Australian/New Zealand Standard Safety of laser products Part 1: Equipment classification (AS/NZS IEC 60825-1:2014)
- Australian/New Zealand Standard Safety of laser products Part 14: A user's guide (AS/NZS IEC 60825-14:2011)

Observations

In general, the management of radiation safety at AAD in relation to controlled material and controlled apparatus was found to be sound. However, in some cases there appeared to be room for improvement as follows:

- The Plans and Arrangements that form the basis for licensing contained references to codes, standards and internal documents that were no longer current.
- There was no evidence that AAD had conducted annual ophthalmic assessments for all personnel working with Class 4 lasers operators.
- There was no evidence that regular contamination monitoring of all persons working in unsealed source laboratories was being carried out.
- Some UV devices had not had their exposure levels compared with relevant limits.

Performance Reporting Verification

The Radiation Safety Officer coordinates information for quarterly reports combining that from Kingston and Hobart with input from each Antarctic base. Once collected, this information is consolidated into a single final report to ARPANSA. AAD quarterly reports have been submitted to ARPANSA in a timely manner in recent years, and contain relevant information, including details of compliance with the Act and Regulations.

Configuration Management

Of those controlled material and controlled apparatus seen during the inspection, all matched the internal designations assigned to those sources and listed in the source inventory workbook (SIW). Further, all sources inspected were present and accounted for in relation to the SIW.

Several laser devices were subject to Section 65 disposal requests at the time of inspection. ARPANSA had approved these requests and the equipment were expected to be disposed of in accordance with the application in the short term.

The radioisotope laboratory at the Kingston premises had not been used for 10 years and the enclosed X-ray unit for 7 years. The latter was stored in a locked case within the main building and was only accessible to personnel with appropriate authorisation.

Training

All personnel using controlled apparatus or controlled material at AAD are required to undertake training related to the particular type of source they will use. This training includes general radiation induction, individual laboratory induction and specific use training, the extent of which depends on the proposed dealing for the given individual. Training records are kept electronically and ARPANSA inspectors observed these records for several individuals authorised to use the controlled apparatus and controlled materials at AAD. The RSO provided a copy of his ANSTO radiation training certificate.

Access to laboratory areas is restricted to personnel who have undergone appropriate induction training. The ARPANSA inspectors observed induction-training records during the inspection.

Security

Access to all AAD buildings beyond the public areas is protected by an electronic access control system. The aggregation of all sources under AAD control, including those in the store, do not invoke enhanced security requirements. The existing security measures were therefore considered appropriate.

Radiation Protection

AAD has demonstrated a commitment to radiation protection by establishing a policy to facilitate the safe and effective use of radiation and the safe storage of radioactive sources. This is supported by two comprehensive radiation management plans that form AAD's plans and arrangements. One document is for ionizing radiation sources and the other for non-ionizing radiation equipment. AAD staff had reviewed these documents within the past 3 years although some referencing within the documents to codes and standards was found to be out of date. AAD uses these documents to achieve compliance with radiation legislation and ARPANSA licence conditions.

Some discrepancies were noted within the documents in relation to what was meant to happen and practices that were taking place such as:

- Annual ophthalmic assessments for Class 4 laser operators had not been taking place. It was noted however, that AAD had scaled back laser work and that the LIDAR had been disposed of. This clause therefore required review should such work resume in the future.
- Regular contamination monitoring of staff working in unsealed source laboratories was not being routinely performed. It was noted that such radioisotope work was only performed at the Antarctic bases at present.

Some of the UV apparatus in the laboratories had not had their exposure levels compared with the relevant exposure limits. The RSO will follow up with the manufacturer of the relevant UV lamps to see if that information is available.

Warning signs restricting access to only approved staff are displayed on the entrance to laboratories using radiation sources.

Event Protection and Emergency Preparedness and Response

Event Protection and Emergency Preparedness and Response were handled under the broader AAD policy and work health and safety plans and was not assessed during the inspection.

Findings

The licence holder was found to be in compliance with the requirements of the Act, the Regulations, and licence conditions.

The inspection revealed the following **areas for improvement**:

1. The Plans and Arrangements contained referencing to out of date documents.
2. Not all aspects of the Plans and Arrangements were being carried out as prescribed such as a lack of:
 - (a) annual ophthalmic assessments for Class 4 laser operators
 - (b) routine personal contamination monitoring for people working in unsealed source laboratories
3. Not all UV apparatus had their exposure levels compared with the relevant exposure limits.

It is expected that improvement actions will be taken in a timely manner.