



Australian Government

Australian Radiation Protection and Nuclear Safety Agency

## INSPECTION REPORT

<b>Licence Holder:</b> CSIRO Oceans and Atmosphere	<b>Licence Number:</b> S0019
<b>Location inspected:</b> Aspendale, VIC	<b>Date of inspection:</b> 2 December 2015
	<b>Report No:</b> D1546437

An inspection was conducted under Part 7 of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act). The purpose of the inspection was to assess compliance with the Act, applicable regulations, and licence conditions. The inspection was conducted as part of ARPANSA's baseline inspection program.

The scope of the inspection included an assessment of CSIRO Oceans & Atmosphere (O&A) performance based on the source licence Performance Objectives and Criteria. The inspection consisted of a review of records, interviews, and a physical inspection of the controlled materials and controlled apparatus at the Aspendale, Melbourne premises.

### Background

The role of CSIRO O&A is to deliver oceans and atmospheric science needed for a sustainable, healthy and well prepared Australia as part of a global effort focused on climate, energy and air quality interactions and climate, carbon and water feedbacks. Their research aims to provide scientific knowledge and tools to support commercial development of Australia's marine resources (e.g. fisheries, offshore oil and gas) while mitigating environment impacts and conserving marine biodiversity. CSIRO O&A has several sites throughout Australia including Victoria, New South Wales, Western Australia, Queensland, ACT and Tasmania. The Aspendale site has multiple types of controlled materials and controlled apparatus consisting of sealed radioactive sources, lasers and an ultraviolet source. Configuration management at CSIRO O&A involves ensuring that the controlled apparatus and material are used and maintained in accordance with the design and licensing requirements as expressed in relevant documentation.

### Observations

In general, the management of radiation safety at the CSIRO O&A Aspendale premises was found to be satisfactory.

The *Radiation Protection Plan* (RPP), CSIRO O&A's Plans and Arrangements, were comprehensive and covered Effective Control, Policy Framework, Radiation Protection, Source Inventory Management, Incidents and Emergency Preparedness situations. CSIRO O&A had reviewed the RPP following the inspection at the Dutton Park premises in September 2015 to reflect ARPANSA feedback resulting from that inspection. There were, however, some inconsistencies and ambiguities noted within the document as follows:

1. Section 1.4 of the RPP refers to an old laser standard AS/NZS 2211.1 where it should be AS/NZS IEC 60825.1.
2. The training needs analysis undertaken for safety critical roles was not formally documented. The training requirements for a site radiation safety officer were based on assessment of the type of source dealt with at the site. There was no evidence to show that the approach to training was

systematic for the business unit RSO and the site RSO and that the requirements are clearly defined.

3. Section 4.3.1 of the RPP refers to Radiation Dose Limits. Laser emissions are, however, based on maximum permissible exposure which is, in fact, an exposure limit. Further, the table reference to dose limits for ionising radiation should reflect current ARPANS Regulations (e.g. the equivalent dose limit for the lens of the eye for occupational exposure was listed as 50mSv instead of 20mSv).
4. Section 3.2.3 of the RPP on Personal Protective Equipment (PPE) does not address activities involving the calibration, maintenance or replacement of embedded laser or UV sources in enclosed equipment where PPE would be required upon removal of any protective covers or barriers.

The next major review of the RPP was scheduled for October 2016, although CSIRO policy was to make changes to the RPP following feedback made during ARPANSA inspections. Organisational or legislative change could also initiate a review of the RPP.

Access to the building was restricted to CSIRO O&A personnel with swipe cards.

There were no unsealed radioactive materials at the Aspendale premises of CSIRO O&A. Laboratories containing controlled apparatus and controlled material were labelled in accordance with the requirements of the relevant Australian Standard. Labels were also affixed to controlled apparatus and controlled material to indicate that they were licensed with ARPANSA.

Radiation measurements were taken on and around each sealed source used for calibration purposes. The surface dose rates were approximately 20 $\mu$ Sv/h and at one metre, no dose rates above background were measured.

Measurements taken around the locked storage cabinet in which a controlled sealed source (LSI: 1418) was being stored showed no dose rates above background levels confirming that the cabinet was adequately shielded.

It was noted that the sealed source (LSI: 1431) on the SIW stated an activity of 74MBq however, the manufacturer's source label indicated that the activity was 370MBq. In addition, the following sources (LSI: 1428, 1429 and 1402) were either located in a different building and/or room as shown on CSIRO O&A's current SIW for the Aspendale site.

SIWs were positioned on or near each controlled apparatus or located where controlled material is stored. The SIWs were less than 12 months old since the last revision.

The laser and UV controlled apparatus were examined during the inspection. Interlocks were in place and found to be working. All personnel who were required to use the equipment were appropriately trained. Training records were kept and sighted during the inspection.

It was observed that several cables had expired electrical compliance tags (refer Australian and New Zealand Standard AS/NZS 3760 '*In Service Safety Inspection and Testing of Electrical Equipment*'). It was also noticed that general housekeeping in Room G27 was poor.

CSIRO O&A's quarterly reports had been submitted to ARPANSA in a timely manner and contained relevant information, including Regulation 52 and 53 submissions for the acquisition, relocation and disposal of sources. The quarterly reports contained no reports of incidents or accidents, which was confirmed by CSIRO personnel during the inspection.

## Findings

At the time of inspection, it appeared that the licence holder had complied with the Act, applicable regulations, and licence conditions.

### Good Practice

One good practice was identified during the inspection. CSIRO has an agency wide presentation after each ARPANSA inspection, for example '*Lessons Learnt ARPANSA Clayton Planned Inspection 21 October 2015*' to discuss the outcome of the audit, areas for improvement, observations and good practice.

The following performance deficiencies, if properly addressed, will support performance improvement efforts:

### Performance Deficiencies:

1. A Systematic Approach to Training (SAT) is a methodology for ensuring that staff are prepared to carry out their work by having the requisite knowledge, skills, and abilities to succeed in their assignments. An analysis of training needs for certain safety-critical positions, such as the business unit and site Radiation Safety Officers, was not documented;
2. In some cases, review of the Radiation Protection Plan has not been effective or timely as evidenced by the reference to out-of-date standards;
3. Eye protection requirements when activities involve the calibration, maintenance or replacement of embedded laser or UV sources in enclosed equipment were not consistent between the RPP and SIW; and
4. In some instances, inventory control has been less than effective in ensuring the correct location and activity of sources.