



Inspection report

Licence holder: Department of the Environment and Energy	Licence number: S0015
Location inspected: 3 Pederson Road, Eaton NT 0820	Date/s of inspection: 31 May to 1 June 2018
	Report no: R18/06633

An 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 1999 (the Regulations), and conditions of Source Licence S0015.

The scope of the inspection included an assessment of Supervising Scientist Branch's (SSB) performance against all inspection areas of the Source Performance Objectives and Criteria (PO&Cs). The inspection consisted of a review of records, interviews, and physical inspection of sources.

Background

SSB of the Department of the Environment and Energy undertakes research and environmental monitoring to assure the environment in the Alligator Rivers Region of the Northern Territory is protected from the effects of uranium mining. Some of the research undertaken by SSB involves the use of radiation sources.

The main codes and standards applicable to these sources are:

- Code for Radiation Protection in Planned Exposure Situations (2016) (RPS C-1)
- Australian Standard Safety in Laboratories - Ionizing Radiation (1998) (AS 2243.4-1998).

Observations

In general, the management of the radiation sources held by SSB was observed to be effective and appropriate to the hazard of the sources. It was noted that the areas for improvement previously highlighted by ARPANSA in the inspection conducted in September 2015 had largely been implemented.

Performance, reporting and verification

The reporting to ARPANSA met the requirements specified by the ARPANS legislation and the source licence. SSB has an internal reporting system, which forms a part of the document management system. The reporting system was found to be an effective tool to register events and manage actions arising from the investigations. There were two radiation related events registered in the system over the last two years. Both events were appropriately investigated and recorded. Slightly elevated personal dose

measurements were recorded during the transition from thermoluminescent (TLD) to optically stimulated luminescence (OSL) dosimeters. These were also investigated.

Configuration control

The main documents forming the plans and arrangements to manage safety were found to be mature and reviewed by the licence holder according to requirements stipulated in the legislation. The processes related to the SSB activities are formalised and managed by the business management system using SharePoint software. The system includes the risk register that is updated periodically or more often, if based on the event investigations.

Inspection, testing and maintenance

The radiation monitor observed during the inspection were found to be within the calibration period. The maintenance is carried out according to the procedures incorporated in the instructions and manual that form the business management system however some documents did not include safety related information for users. For example, the licence holder uses ultraviolet lamps to sterilise samples. The review of the Ecotoxicology Manual 6ECOTX30 indicated that they do not include appropriate safety warnings particularly for maintenance activities.

Training

All SSB employees are required to undergo an induction to make them aware of the radiological hazards present, the framework within SSB for managing radiation, and the regulatory requirements associated with the SSB licence. This induction should occur irrespective of the individual's role. In addition to this SSB have been performing a training needs analysis for their employees and have started defining and documenting all training requirements for all personnel. Some training, for instance first aid training, has a legislative requirement to undertake a refresher course at a specified frequency however the induction training and role specific radiation protection training do not include periodical refresher.

The training records of nine individuals were examined. This was a sample of almost twenty percent of the SSB organisation. These personnel were a mixture of managerial and staff. Seven individuals worked in technical positions directly associated with radiation whilst the other two were in non-technical roles. The records for the personnel in technical roles were found to be complete and up-to-date, however, the records of two other personnel whose work was not directly related to radiation did not show the radiation induction had been completed.

Event protection

The established procedures and manual contain the emergency protocols that cover the foreseeable situations. The emergency procedure for fires in WHS-014 Radiation Source Control Plan include principles for fires involving unsealed radioactive sources. Although the procedure for larger fires requires evacuation of the building it does not cover assurance that the evacuated personnel are free from radioactive contamination.

Security

The security arrangements in place were reviewed. This included access control to the buildings, radioactive sources and handheld X-ray analysis machines, which are kept in the locked cabinets. The cabinet keys are appropriately controlled with the access restricted to the responsible personnel. There have been no security incidents reported.

SSB had categorised their sources in accordance with the Code of Practice for Security of Radioactive Sources (RPS 11). The sources do not require enhanced security as normal business management arrangements in place for safety purposes are considered adequate to ensure the physical security of these sources.

Radiation protection

Personal dosimetry has been issued to a number of workers. The workers' badges are stored with the control monitor in an office environment and away from the radioactivity in the laboratories. The records of the measured doses are held in paper-based files. There are however, technological provisions available for these records to be digitised in the future to ensure they are maintained for the required timeframe. The staff dose records were observed to be very low historically.

The procedures in place covered the activities associated with sources and environmental samples. Although it appeared the procedures were generally followed, a minor deviation was observed. WHS-014 Radiation Source Control Plan requires the radiation safety officer to conduct an audit of radiation sources annually. It was observed that the records of such audits are missing. The licence holder representatives explained that the formal audits of sources had not been conducted recently however the sources are appraised more often on an informal basis.

There were no significant changes in the inventory of radioactive material held in the source store since 2015. The records indicated that gamma radiation surveys of the store had previously been conducted biennially with the last records dated 2015. The last record showed the dose rates external to the store are substantially below the dose rate limit set out by AS2243.4 for areas accessible to non-occupational persons.

The source store holds small quantities of naturally occurring radionuclides that have the potential to emit radon. This has been considered in the design of the store as an air extraction vent is located at floor level. The store is vented for a minute prior to entry. This duration is based on normal convention rather than being based upon a scientific characterisation of the activity concentration of radon present within the store.

SSB has a variety of sources which are used for calibrating their gamma spectrometers. AS2243.4 recommends that wipe testing is conducted annually to assure that the integrity of the source encapsulation remains intact, however AS2243.4 requires that, as a minimum, leak testing is performed at ten yearly intervals. In conjunction with this the ARPANSA guide for *Wipe Testing of Sealed Sources and Use of Sealed Sources Beyond Recommended Working Life* (February 2013) has established the expectation that sources used past their recommended working lives are wipe tested annually and the records retained. It was observed that SSB had not conducted a wipe test in the last couple of years.

Emergency preparedness and response

Emergency procedures are locally displayed in the laboratories. The workplace include the emergency showers and eyewash fountains that are tested weekly. The records of the tests are maintained.

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 local procedures are not always followed. The examples were discussed above in section 'Training and radiation protection'.
2. The procedures do not always include safety related information for users. The examples were discussed above in sections 'Inspection, testing and maintenance', 'Emergency protection', and 'Radiation protection'.

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

No written response to this report is required

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