



Inspection report

Licence Holder: ARPANSA	Licence Number: S0002
Location inspected: ARPANSA Radiation Health Services, Yallambie, VICTORIA	Date/s of inspection: 17 May 2017
	Report No: R17/06451

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 S0002.

The scope of the inspection included an assessment of the Radiation Health Services (RHS) Branch's performance against the Source Performance Objectives and Criteria (PO&Cs). The inspection consisted of a review of records, interviews, and physical inspection of the site.

An officer from the Queensland radiation regulatory authority (Queensland Health) participated in the inspection to avoid potential conflict of interest.

Background

RHS maintains systems for the measurement of radioactivity in the environment and potential exposure to people. This includes measurement of radioactivity and the analysis of samples including ultraviolet radiation, extremely low frequency electric and magnetic fields (ELF), and radiofrequency (RF) radiation. RHS is also responsible for the storage of a certain amount of radioactive material awaiting long term disposal.

RHS is licensed under section 33 of the Act to deal with controlled material and ionising and non-ionising controlled apparatus.

Observations

Overall, it was observed that RHS demonstrated its commitment to radiation protection principles and practices in the management of their radioactive materials. However, there were some areas that required improvement in relation to inventory management, safety and security culture, and change management.

Performance Reporting and Verification

All quarterly reports had been provided in a timely manner and included relevant information. RHS maintains a detailed electronic inventory of controlled materials and controlled apparatus located within the Yallambie site. However, when reviewing the inventory records it was observed that some source aggregation calculations did not take into consideration the total radioactivity of sources. In these cases, activity concentration was not combined with the mass of the radionuclide to determine the total activity. Additionally, the inventory record did not always clearly link to the Source Inventory Workbook (SIW) entry to ensure that information in the SIW is maintained accurately.

Whilst in practice the Radiation Safety Officer (RSO) and Radiation Protection Advisors (RPAs) periodically conducted inventory checks, the frequency and responsibility to do so was not documented in the plans and arrangements.

Discussions with a senior scientist at RHS indicated that some radioactive materials may not be in secular-equilibrium. Confirmatory gamma spectroscopy measurements had not been undertaken to determine which materials were not in equilibrium. The inspection team noted that this could have potential long-term implications for the safe management of materials as the dose rate can increase over time before decreasing, and activity decay calculations could be affected.

Drums containing legacy radioactive materials were labelled with the appropriate identification numbers and adequately stored in a dedicated room which is considered to be fit-for-purpose. However, the complete composition of radionuclides in the drums was not always fully listed on the labels. It is important for labels to accurately reflect the contents within containers or drums to ensure that personnel can adequately manage and account for their inventories. Records were provided to the inspection team after the inspection that described the contents of the drums in full, including a description of the items and their radiological attributes.

In an adjacent source storage room, some drums containing soil samples which were thought to contain low levels of radioactive material were not recorded on the Inventory. The exact nature and contents of these drums could not be provided at the time of the inspection. However, the labelled radionuclide did not appear on the Inventory. It is a condition of licence that all controlled materials are accurately recorded in the inventory.

Within the same storage room a crane system was installed for the purposes of moving heavy radioactive source containers. It was acknowledged by RHS staff that due to the restrictive physical space within the store room, and no direct line-of-sight visibility of the source containers for the operator of the crane, that there remains a potential for accidents to occur when moving source containers. It was noted that efforts have been initiated to have the crane system audited against the relevant Australian Standards. An adequate risk assessment for the functions and activities that are performed within the storage room was not available during the inspection.

Change Management

When conducting the physical inspection it was observed that some changes to the laboratory had been performed recently and some were planned for the future. A review of records had shown that RHS had reported (under Regulation 52) many of the recent changes made to the laboratory where radioactive material was directly involved. However, the physical and infrastructure changes did not appear to have been reported prior to 2014. Under the plans and arrangements there was no documented change management requirement to perform an assessment of the safety significance, and the requirement for reporting under Regulation 51 or 52. Clear instructions on how to perform these assessments will ensure that all relevant changes are communicated as required by the Regulations.

RHS has a comprehensive *Hazards Identification Risk Assessment and Management Form (HIRAM)* which is used to assess and manage risks associated with a particular work practice. Additionally, it was reported that there is a culture of consultation with relevant subject matter experts throughout the WHS and Radiation Safety committees.

The newly-appointed RSO demonstrated a good understanding of holistic safety principles during discussions on HIRAM. While a number of human, organisational and technological considerations are listed on the current HIRAM for analysis, the risk assessment process could be improved by more

explicitly acknowledging holistic safety principles. It was also observed that the agency's organisational risk appetite thresholds were not linked to the HIRAM. It is important to know what levels of risk will be accepted by the organisation to ensure that risk treatment options meet the organisation's expectations.

Safety and Security Culture

In general, the security culture was satisfactory. Staff were knowledgeable about ARPANSA's RPS-11 *Code of Practice for the Security of Radioactive Sources* and displayed an understanding of the graded approach to be applied to different materials. However, during the inspection two examples were observed where keys were either left unsecured on a desk or suspended in the locking mechanism in the safe for which it was intended to secure. The keys are intended to restrict access to radioactive materials. It is important for those who are authorised to have access to the radioactive material to be responsible for maintaining appropriate security practices.

Within one of the store rooms, laboratory glassware with radioactive material labels was located on the floor presenting a slip and trip hazard in a congested floor-space. There was no evidence of the assessment of these risks being considered or of processes to support such an assessment as part of normal work. It was also observed that the housekeeping and organisation of this room could be improved. It was noted that regular assessments and reviews of hazards in the work place through internal auditing or routine tasks can help to build a strong safety culture.

The reporting of minor incidents and near misses to the regulator was also not clearly documented.

Findings

The inspection revealed the following **potential non-compliance**:

1. The source inventory was not always up to date and accurate. Specifically, some controlled materials were not recorded in the inventory.

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

1. **Performance Reporting and Verification.** The inventory management system was not fully effective at times, such as in ensuring the concentrations and aggregation was calculated accurately.
2. **Change Management.** Plans and arrangements did not cover the requirement for the reporting of changes under Regulation 51 or 52.
3. **Risk assessments.**

Risk assessments were not always performed for complex actions, or for temporary changes such as the storage of laboratory materials.

The HIRAM risk assessment did not adequately take into consideration holistic safety principles or link with the agency's risk appetite.

4. General safety and security culture required improvement in some areas.

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