Inspection report

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| **Licence holder:** ARPANSA Radiation Health Services Branch (RHS) | **Licence number:** S0002 |
| Location inspected: Yallambie, Victoria | **Date of inspection:** 13 June 2019 |
| **Report no:** R19/06897 |
| 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 2018 (the Regulations), and conditions of source licence S0002.  The scope of the inspection included an assessment of ARPANSA’s performance against the Source Performance Objectives and Criteria (POCs). The inspection consisted of a review of records, interviews, and physical inspection of sources.  A radiation safety inspector from the South Australian Environment Protection Authority participated in the inspection to provide additional independence. 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, low frequency electric and magnetic fields (ELF), and radiofrequency (RF) radiation. RHS is also responsible for the storage of radioactive material awaiting ultimate disposal.  RHS is licensed under section 33 of the Act to deal with controlled material and ionising and non-ionising controlled apparatus.  The main codes and standards applicable to these sources are those that appear in section 59 of the Regulations plus:   * Australian/New Zealand Standard: *Safety in laboratories Part 4: Ionizing radiations* (AS/NZS 2243.4:2018) * *Radiation Protection Series C-6: Code for Disposal* of Radioactive Waste by the User (2018) * [Australian/New Zealand Standard: *Safety in laboratories - Non-ionizing radiations -Electromagnetic, sound and ultrasound* (AS/NZS 2243.5:2004)](https://www.standards.org.au/search-for-a-standard) * Australian/New Zealand Standard: *Photo-biological safety of lamps and lamp systems* (AS/NZS IEC 62471:2011) * *Radiation Protection Series 12:* *Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation (2006)*   In addition the plans and arrangements for S0002 were reviewed against the regulatory guide *Plans and Arrangements for Managing Safety* REG-LA-SUP-2400B.  It was noted at the time of the inspection that although S0002 has a provision for laser products under Group 1 Item 23, as set out in Part 1 of Schedule 3C of the Regulations, that ARPANSA currently does not hold any controlled apparatus of this type under this licence. Observations The licence holder was found to be in compliance with the Act, the Regulations, and licence conditions. The assessment also concluded that RHS continues to demonstrate that meet the principles of the Source POCs in controls, behaviours and management system.  Five (5) areas for improvement were identified relating to documentation of accountabilities and responsibilities for radiation protection, change control, expansion of emergency response procedures to reflect the Emergency Exposure Guide, expansion of incident investigation procedures and assurance measures for the integrity of sealed sources.  In addition one good practice was identified relating to the implementation of a remote sensing technology in the Waste Stores.  The issues raised from the last inspection conducted in 2017 were noted to have been actioned and closed out appropriately. Performance reporting and verification Quarterly reports since the last inspection in 2017 were reviewed against the requirements of ARPANSA Guide Reporting Compliance (REG-COM-SUP-270B v10.1) and demonstrated that safety and security reporting requirements had been established and were considered to be satisfactory.  At the time of the inspection a number of documents were under review or development with publishing planned in the near future. This included the Radiation Safety Manual, a Control of Changes procedure and the Emergency Response procedures for ionising radiation. The current operational documents making up the plans and arrangements were all found to be within the three (3) year statutory review period with a number marked for revision by the end of 2019.  Effective control was discussed in relation to the Regulatory Guide Plans and Arrangements for Managing Safety. Whilst the role of the senior management, the Radiation Safety Committee, the Licence Holder, Radiation Protection Advisors and Radiation Safety Officers and ownership of the plans and arrangements are understood by RHS, the descriptions were not consistently defined across the suite of available plans, including: OHS-RSM-POLICY ARPANSA Radiation Safety Policy, OHS-RSM-IRSP-SOP-001 Ionizing Radiation Safety Strategy, OHS-RSM-IRSP-SOP-002 Control of Ionizing Radiation Exposures, OHS-RSM-UV-SOP-001 Ultraviolet Radiation Safety Strategy and OHS-RSM-UV-SOP-002 Control of Ultraviolet Radiation Exposure). It is important to ensure that roles and responsibilities are uniformly described so that personnel appointed in specific roles have clear guidance on their duties.  The system for reporting and investigating events for continuous improvement as defined by Issue Management (IMR) User Guide and Non-Conformance and Continuous Improvement Management ARPANSA-QM-SOP-170 was reviewed and two examples of recent radiation safety related events under S0002 examined. It was noted that management review of the issues register is conducted for trending every six (6) months and that the Radiation Safety Committee also review radiation safety events. The register is also reviewed on a more frequent basis by the Quality Manager to monitor timely closure of actions.  ARPANSA-QM-SOP-170 contained clear instructions for the management of events but did not include clear guidance on the available investigative methods to facilitate the identification of a root cause to events, or guidance on the use of multi-disciplinary teams, which in practice is applied at ARPANSA for larger scale incidents. It is important that those who are charged with the responsibility to conduct investigations have clear guidance on the processes to follow. Configuration control Risk assessed examples of changes were reviewed which demonstrated that potential impacts on the radiological safety margins and other potentially affected work areas had been considered and managed appropriately.  Project 0025 for the refurbishment of a new waste storage area and the associated acceptance of low level waste from the University of Melbourne was reviewed along with the recent introduction of the *Historian* software application to the existing dose monitoring system. It was noted that the assessments conducted met the requirements of the performance objectives and criteria. However at the time of the inspection, it was agreed that RHS would benefit from introducing a specific change control procedure in order to formalise the requirement to consistently apply the process that had been achieved in practice. Radiation protection (including inspection testing and maintenance) During the inspection it was found that a collaborative working relationship had been established between the radiation safety officer and the quality manager which supported radiation safety for RHS.  The terms of reference and past minutes from the ARPANSA Radiation Safety Committee were reviewed and it was determined that the quality and detail of the minutes was very good. It was noted that a range of radiation protection and nuclear safety issues were being managed, including the provision of advice on change, responses to previous inspections and documentation updates.  Staff doses are reported to ARPANSA quarterly and remain well below the statutory limits set in the ARPANSA regulations. No instance of exceeding the dose constraints set under An Introduction to Ionising Radiation Safety at ARPANSA OHS-RSM-IRSP-SUP-007 have been recorded for staff working under S0002 to date.  Records of routine radiological surveys were reviewed which revealed high quality assessments and detail. A number of areas were also physically inspected including the radon laboratory, the radio-isotope laboratory, the Ultra Violet laboratory and the three waste storage areas. Signage was found to be in compliance with AS/NZS 2243.5:2004, security arrangements were appropriate to the inventory. Personal protective equipment, emergency spill wash stations and calibrated monitoring equipment were available. Fume hoods were found to be serviced within the required timeframes.  RHS has a range of legacy sealed sources earmarked for ultimate disposal and others which are still considered to be operational. Wipe testing of sealed sources is conducted for operational sources although the frequency was not always aligned with ARPANSA Guide Wipe Testing of use of sealed sources beyond recommended working life (REG-COM-SUP-270A). In addition no review of recommended working life of legacy sealed sources has occurred. In order to verify the integrity of legacy sources and review RHS’s inventory to determine sources that may still be of use, it was agreed that RHS would benefit from initiating a deliberate campaign to review all recommended working lives of sources and to conduct base-line wipe testing where appropriate. The results of such a campaign would inform an ultimate disposal waste management plan for disused radioactive sources.  When inspecting waste store rooms it was explained to the inspectors that radon levels can elevate in particular rooms in the event of a power failure which stops the exhaust fans. A unique radon remote sensing monitor operated in combination with a mobile phone application was used to provide live real‑time monitoring of the radon levels prior to opening the door. This simple but bespoke solution to confirming the radon levels prior to entry was considered a good practice in radiation protection. Emergency preparedness and responseThe procedures which formed RHS’s Emergency Plans and Arrangements were reviewed (OHS-RSM-IRSP-SOP-006 and OHS-RSM-UV-SOP-006 Emergency Procedures Ultraviolet Radiation). It was found that the range of potential incidents that may occur were not fully documented and that the response to events could be expanded past the current procedure which requires consultation with the Radiation Safety Officer. In addition, it was agreed that in order to verify that the arrangements in place are considered adequate, the conduct emergency exercises for potential incidents should occur more frequently.Training Radiation safety training records were examined against the performance objectives and criteria requirements. Training requirements for ionising (OHS-RSM-IRSP-SOP-007) and non-ionising (under OHS-RSM-UV-SOP-003) have been identified for roles important to safety and applied with training records and completed laboratory competency matrixes available for authorised staff and management. These records were considered to be adequate. Security Security controls for S0002 were reviewed for compliance with the Code of Practice on the Security of Radioactive Sources and no issues were identified. It was noted that security category aggregations of unsealed sources had been calculated, consistent with the recommendations of IAEA Nuclear Security Series No. 14, and that no amendment to the existing security arrangements was required for this inventory. 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 good practice:   1. Radon remote sensing monitors were installed allowing real-time radiation protection information to be available prior to entry into waste stores.   The inspection revealed the following areas for improvement:   1. Effective Control Plan for RHS should be reviewed against the Regulatory Guide Plans and Arrangements for Managing Safety REG-LA-SUP-2400B to ensure accountabilities and responsibilities for the licence is consistently documented. 2. More detailed incident investigation procedures should be developed. 3. A dedicated change control procedure should be developed to ensure consistency in the approach taken to managing change. 4. A specific campaign should be initiated in order to review the recommended working life of disused sources including conducting source integrity wipe tests to inform an ultimate disposal waste management plan. 5. Emergency procedures should be reviewed against the ARPANSA Emergency Exposure Guide and exercises should be conducted more frequently against potential incidents in order to verify the adequacy of arrangements.   It is expected that improvement actions will be taken in a timely manner. | |

*No written response to this report is required*

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