



Inspection report

Licence holder: Department of Industry, Innovation and Science - National Measurement Institute	Licence number: S0142
Location inspected: Lindfield and North Ryde NSW	Date/s of inspection: 11-12 December 2019
	Report no: R19/13817

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 S0142.

The scope of the inspection included an assessment of National Measurement Institute’s (NMI) performance at Lindfield and North Ryde NSW against the Source Performance Objectives and Criteria (POCs). The inspection consisted of a review of records, interviews, and physical inspection of sources.

Background

National Measurement Institute develops and maintains Australia’s primary measurement standards. They deliver a broad suite of measurement services to government, industry and the community covering calibrations, chemical and biological analysis. The licence holder is authorised under section 33 of the Act to deal with sealed sources used for calibration purposes, sealed sources in fully enclosed analytical devices, X-ray analysis units, laser products, optical sources and microwave and radiofrequency systems.

The main codes and standards applicable to this licence 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)
- Australian/New Zealand Standard *Photobiological safety of lamps and lamp systems* (AS/NZS IEC 62471:2011)
- Radiation Protection Series No. 3 *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz* (2002) (RPS 3)
- ICNIRP *Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields 1 Hz – 100 kHz* (2010)
- 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)
- Radiation Health Series No. 9 *Code of practice for protection against ionising radiation emitted from X-ray Analysis Equipment* (1984) (RHS 9).

Observations

In general, the management of safety and security at the National Measurement Institute was found to be satisfactory. The licence holder's latest plans and arrangements contained within the NMI '*Radiation Safety Manual*' (RSM) Issue No: 3.4 on the 13 November 2019 (RSM) was examined. The inspection highlighted the RSM needs to be revised to update the reference to the 2018 Regulations and remove reference to radioactive material and certain parts of section 6 which are related to sealed sources and electron capture detectors as discussed during the inspection.

There appeared to be room for improvement in the areas of training, labelling of controlled apparatus and the identification of the correct groupings of items within the source inventory worksheet (SIW). NMI needs to audit its laser inventory on their SIW for compliance with labelling and visibility requirements of the laser standard AS/NZS IEC 60825-1:2014.

During discussions related to the SIW it was noted that certain laser products with accessible emission limits (AEL) of 5 mW in the visible region may no longer be deemed controlled apparatus as required by section 9(1)(a)(viii) of the Regulations. NMI should measure accessible emission to determine if they exceed the AEL of a Class 3R laser product.

Performance reporting verification

NMI's quarterly reports are submitted to ARPANSA in a timely manner and contain relevant information including details of compliance with the Act and Regulations. Information for quarterly reports is coordinated by the Safety Manager into one final report to ARPANSA.

Other documentation required by ARPANSA such as submissions for approval under sections 63 and 65 of the Regulations are also coordinated through the Safety Manager as needed.

Configuration management

Of the controlled apparatus seen during the inspection, all were noted as matching the internal designations assigned to those sources and listed in the SIW. Further, all sources chosen to be inspected were present and accounted for in relation to the SIW. The inspectors were advised that an internal audit of radiation sources is being done quarterly by the Laboratory Managers and the RSO audits the radiation sources against the SIW annually. An audit report was provided during the inspection.

Training

Management and staff collaboratively identify and discuss safety issues and work together to action improvements. During the previous inspection, it was noted that the National On Site Training (NOST) has provided training for staff using UV sources. Training records were provided for the authorised laser users who successfully completed the laser safety course provided by the UNSW (ADFA). Refresher courses on laser, UV, microwave and RF safety were provided for all staff internally as required. During discussions with staff and the Safety Manager, it was apparent that safety was a high priority and that safety culture appeared to be good.

Event protection and Emergency preparedness & response

A copy of the 'Site Emergency Management Plan' Version 3 (September 2019) was provided for the Lindfield site; it lists the evacuation plans and procedures in place in the event of an emergency. Evacuation exercises are held annually. Both the Lindfield and North Ryde sites are deemed to be secure and not high risk facilities.

Security

Access to both the Lindfield and North Ryde sites are protected by an electronic access control system. The aggregation of all sources under NMI control do not invoke enhanced security requirements. The existing security measures were therefore considered appropriate.

Radiation protection

NMI management has demonstrated a commitment to radiation protection by establishing a policy to facilitate the safe and effective use of radiation. This is supported by a comprehensive Radiation Safety Manual (RSM) to achieve and maintain best practice and compliance with radiation legislation and ARPANSA licence conditions.

During the last inspection of the Lindfield site, there were sealed radioactive sources in a waste store. The store held legacy waste inherited from operations conducted prior to the formation of NMI and was awaiting disposal. The store was locked and the only key held by the Quality and Safety Manager. Appropriate signage were clearly visible. In March 2019 approval was given by ARPANSA for the disposal of the legacy waste via SGS Radiation Services. During this inspection measurements were taken near the original location of the drums of radioactive material in the waste store and only background radiation was measured. We were also advised that the waste store would be demolished sometime in the future.

Inspectors noted that the warning signage on and adjacent to the Thermo Scientific Niton XRF analyser displayed the laser hazard symbol not the ionising radiation hazard trefoil. This was rectified during the inspection. Currently two people are authorised to use the XRF apparatus with training provided by Portable Analytical Solutions P/L. Training records were viewed during the inspection. The XRF has keypad access with interlocks and appropriate shielding. The following work instructions are provided with the XRF (Operation & Maintenance of XRF Analyser - SOP V1.6 01/03/2019 and Radiation Management Plan for Thermo Fisher Niton Analyser Field Portable Analytical Radiation Apparatus V1.3 31/08/2018).

Inspectors noted on the SIW that source NA138 has been incorrectly categorised as a G1-22 (optical source) and not a G1-23 (laser product). This was due to the intended purpose of the device to pump an optical source (NA134) so both were deemed a G1-22. After discussion with the custodian of the device NA138 will be changed to a G1-23 (laser product) grouping and the warning signage replaced.

The laser laboratories inspected were interlocked and alarmed with visible warning signage when the laser was active. For some of the laser products built by NMI which incorporate laser diodes, technical information was attached to the device but there was no warning signage as required by the laser standard AS/NZS IEC 60825-1:2014. There were also some lasers attached to optical benches with straps to secure the laser product to the bench where the straps covered the labels. The laser standard AS/NZS IEC 60825-1:2014 requires labels to be clearly visible during operation, maintenance or service.

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**:

- Appropriate radiation training courses need to be identified to meet the requirements of NMI RSM
- Some laser devices did not have durable and clearly discernible/visible warning labels as required by the laser standard AS/NZS IEC 60825-1:2014
- A laser product was deemed an optical source in NMI's SIW.

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

No written response to this report is
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