



Inspection report

Licence holder: ANSTO – Waste Operations	Licence number: F0260
Location inspected: Lucas Heights Science and Technology Centre (LHSTC), Sydney	Date/s of inspection: 16-17 June 2020
	Report no: R20/05792

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 facility licence F0260.

The scope of the inspection included an assessment of ANSTO’s performance against specific Performance Objectives and Criteria (POCs): Configuration Management and Training. The inspection consisted of a review of records, interviews, and due to the current COVID-19 pandemic was conducted via virtual means.

Background

ANSTO’s Waste Operations Facility (F0260) consists of several waste and service specific sub-facilities for the management of all of ANSTO’s radioactive wastes and nuclear materials. The key processing activities and waste management areas are generally grouped according to waste types. These include low and intermediate wastes (both solid and liquid), nuclear material, disused sources and decontamination and laundry services.

Under F0260, ANSTO are authorised for the safe and secure storage, handling and processing of the aforementioned radioactive wastes.

The main codes and standards applicable to this licence 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)

Observations

Configuration management

Management system audits are conducted on an annual basis. These are performed by accredited auditors, both internal and external to the facility, to assess compliance with the systems in place. Audits look at a range of different aspects such as any potential areas of concern/risk identified by management as well as applicable codes and standards. Recent audits have been completed around training and criticality. These audits take place every 12 months and are scheduled to align with the financial year.

While effort is made to adhere to the schedule, items may be deferred to the subsequent year due to operational pressures. These are recorded and planned within ANSTO's Governance, Risk and Compliance system along with any audit findings.

Audits against ARPANSA's regulatory requirements are performed on an as needs basis and are risk-informed. ANSTO has recently completed a site-wide audit against RPS C-1 (ARPANSA's Planned Exposure Code) along with a mapping of licences that, as a condition of licence, require a 3-yearly review against applicable codes and standards. This has recently been completed for the Waste Operations facility which has had actions and timeframes assigned to it.

With regards to nuclear safety issues, ANSTO employs a criticality safety group to conduct assessments to ensure there is no possibility of a criticality incident. As part of annual housekeeping inspections, this criticality safety group will perform their own inspection to ensure the required conditions have not changed or altered as demonstrated by criticality certificates.

Safety Analysis Reports (SARs) and their associated comprehensive safety assessments are scheduled to be reviewed periodically and are conducted by ANSTO's Systems Safety and Reliability (SSR) group. While the standard is that these be reviewed every 3 years, resource constraints across the site have currently seen this increase to a 5 year period. Given the activities performed at the Waste Operations facility that occur between multiple buildings, the SAR is quite a large and extensive document and is divided into various chapters. When the SAR requires an amendment that is more than just editorial in nature (e.g. a change to the current licensing basis), the changes are submitted to ARPANSA for approval. Upon approval, ANSTO uploads the documents to their business management system and the latest revision is then made current. Such changes are generally not made to the entirety of the SAR but only those chapters which are involved in the proposed revision. A desktop inspection revealed inconsistency within the document which demonstrates inconsistent management of the SAR: nuclear material locations are listed without description, nuclear material is being referenced as still existing in its previous location even though it has been removed from the facility, building extension approvals for storage of waste have not been incorporated while subsequent approval for relocation of nuclear material to that same building is included, etc. Updates have also been shown not to occur in a timely manner. This constitutes an area for improvement.

Waste Operations also have four Operational Limits and Conditions (OLCs) to which they must comply. Two of these relate to the water level alarms associated with the gamma ponds which store radioactive material. If it is detected that the water level is outside the operating range (low or high), alarms are sent to the ANSTO Site Operations Centre (ASOC). While these alarms are incorporated into the SAR, they are not found in ANSTO's emergency management document, ASOC Safety Alarm Responses. This is considered an area for improvement.

In addition to this, the OLCs have surveillance requirements stipulated within their respective SAR chapter. From a review of documentation supplied, alarms and sensors had been tested and calibrated at their required frequency for the storage ponds under Waste Operations control, criticality certificates had been audited for compliance against their conditions, and calibrations are conducted on monitoring equipment as part of requirements for the interlocks attached to two separate high-activity hot cells. However, the calibration requirements for the in-cell radiation detectors attached to the interlocks have not always been completed as required by its associated surveillance requirement (i.e. annually). Radiation monitoring attached to an individual cell which indicates both high and low level alarms has not been conducted since February 2019. The cell in question is currently housing high activity waste making the equipment inaccessible for the time being with the waste also being temporarily immovable due to reduced staffing numbers as a result of the COVID-19 pandemic. The high-level alarm had also not been calibrated in 2018.

While the other cell's radiation monitoring equipment is currently calibrated, Waste Operations allowed the surveillance requirement to lapse for more than four months between mid-December and the end of April 2020.

As stated in the IAEA's NS-G-4.4, OLCs and Operating Procedures for Research Reactors, from which the OLC concept has been taken, if an OLC cannot be met it should be reported and the causes should be analysed (7.3). Either instance where calibrations could not or had not been performed were not reported to ARPANSA.

The same OLC that requires annual calibration of in-cell detectors also involves annual verification of the interlock functionality. Functionality was demonstrated in a hot-commissioning report from August 2017. The method for testing the hotcell interlocks has also been incorporated into the Waste Operations procedure, I-5242 B41 Hotcells Operation (3.12. Testing of Hotcell Interlocks), and is essentially the same process that was established in the aforementioned report. Unfortunately, verification of functionality is undocumented and therefore it could not be established whether verification activities took place in order to demonstrate compliance. The IAEA's NS-G-4.4 also states that the operating organisation is responsible for keeping adequate records to verify compliance with OLCs (2.13) and demonstration of compliance with OLCs should be kept and stored (7.4) with the surveillance requirements being a typical record to be retained (3.42(q)).

As stated in the SAR, OLCs are considered mandatory and must be complied with at all applicable times. Such compliance is also a condition of licence.

Therefore, the aforementioned examples relating to the OLC attached to the hotcells is considered to be a potential non-compliance with licence condition 6.

As described within the Plans and Arrangements, safety inspections are conducted as a proactive measure to identify potential safety hazards. Due to the current COVID-19 pandemic response, that incorporates working in rostered teams, social distancing and keeping to basic operations, there have been no recent management safety observations. However, safety inspections have been undertaken with regularity in previous years. Monthly management meetings also take into account previous safety events and associated actions as well as the applicability of lessons learnt from events occurring in other areas within LHSTC.

Waste Operations have developed their own change control procedure (P-7496). This procedure states that change requests are recorded, prioritised and implemented accordingly. The procedure defines change as relating to process, plant and equipment functionality, documentation or staffing but also provides examples delineating what would constitute a change request. In terms of projects or planned changes, these changes are based on need or failure of existing equipment. Such a change requires a post implementation review six months after completion to determine whether the change was effective. However, there is no current formalised post-implementation process and it is not clear if such a process exists for a change made which has not been done as part of a project.

There have also been multiple instances where the process of documenting approvals of changes has not always been complete. While the change control form (F-4086) is an internal document specific to Waste Operations, it requires multiple stages of review. In examples supplied as part of a desktop review, sign-offs signifying review have been left blank. Inspectors were informed that all changes are discussed; however, it was clear the process had not been thorough. Waste Operations are still in the process of determining how this process should work and what benefit it adds. This, along with the aforementioned paragraph relating to change control, is considered to be an area for improvement.

Waste Operations segregates all of its waste into different streams based on the waste type and characteristics. All waste is analysed, appropriately packaged, stored, tracked and recorded. The system

in place allows the facility to maintain effective control of the material in its possession. A pathway exists for waste to be discharged or disposed of if it meets exempt level waste criteria. Those materials that do not fall below regulatory limits are then stored long term or until such time as they are exempt. These materials are subject to periodic inventory review. It is planned that much of the waste within the LHSTC site will be removed to the future national radioactive waste management facility for storage and disposal.

Training

Waste Operations have a document that describes their training program (Training in Waste Management Services P-6599). This describes the requirements attached to four positions: Radioactive Waste Technicians, Waste Supervisors, Waste Engineers and Characterisation Specialists. Both the engineers and characterisation specialists are employed based on their qualifications (degree level) and relevant experience. They are then provided with training specific to their position (e.g. radiation protection, specific radioactive waste training). Radioactive waste technicians are trained in a rotational program based on four key areas: decontamination, intermediate-level waste, low-level solid and low-level liquid waste. It is expected that while competence is achieved in all areas, staff are only expected to be proficient in two of them. This is balanced through a ratio that compares head count and competency in order for the facilities to maintain their capabilities. A supervisor is expected to perform the same tasks and achieve the same competencies as a technician but are expected to utilise the management curriculum provided by ANSTO's Learning Management System (LMS) to improve their leadership and management skills.

Training begins with a documentation review and progress through various iterations culminating in task completion without the requirement of supervision. Authorisation to work unsupervised (i.e. conformation of competence) is only given when the supervisor/trainer is satisfied that work can be conducted in a safe, repeatable and reliable manner. This is approved and documented within the LMS.

Retraining and refresher training is also embedded into the training program within Waste Operations. Refresher training is undertaken annually for staff to stay familiar with each of the areas involved with waste and biennially for work instructions and procedures. This is again confirmed through the LMS on completion. The scenario of retraining staff who have been absent for a prolonged period will correspond to the context of the situation. While there have been no examples in recent memory, there is a process for developing return to work plans ensuring the staff member is fit for purpose, suitable for the role and will consider their experience.

It has been recognised that there are steps missing within some procedures that staff are trained against. The task has been performed appropriately during the training phase but when unsupervised they have realised that some information is missing. This then triggers the waste operations team to update those procedures ensuring they are adequate for future use. ANSTO's Work Health and Safety team has also provided training in the form of a presentation on fatigue management as it corresponds to issues relating to human factors as part of holistic safety.

Findings

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

1. Potential non-compliance with licence condition 6: The licence holder must comply with operational limits and conditions at all times.

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

2. Effective control and timely update of the SAR
3. Inclusion of alarms in ANSTO emergency management documentation

4. Change management process

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

In response to any potential non-compliance, the licence holder must carry out its responsibilities under section 57 of the Regulations

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