



Australian Government

Australian Radiation Protection and Nuclear Safety Agency

INSPECTION REPORT

Licence Holder: Australian National University (ANU)	Licence Number: F0073, F0074 and F0075
Location inspected: Canberra, ACT	Date of inspection: 1-2 September 2015
	Report No: R15/11902
<p>An inspection was conducted under Part 7 of the <i>Australian Radiation Protection and Nuclear Safety Act 1998</i> (the Act). The purpose of the inspection was to assess compliance with the Act, applicable regulations, and licence conditions. The inspection was conducted as part of ARPANSA's baseline inspection program and the scope included all areas defined by the facility licence performance objectives and criteria.</p> <p>Background</p> <p>ANU hold the following facility licences:</p> <ul style="list-style-type: none"> • Facility Licence F0073 authorising operation of Rutherford Back Scatter Accelerator (RBS) • Facility Licence F0074 authorising operation of the Heavy Ion Accelerator (HIA) • Facility Licence F0075 authorising operation of the High Energy Implanter Accelerator (HEI) <p>The Research School of Physics and Engineering (RSPE) operate the HEI to undertake a materials engineering process by which ions of a material are accelerated in an electrical field and impacted into a solid. The RBS is a 1.7 MV ion accelerator for ion beam analysis with capabilities that include Rutherford Backscattering Spectrometry/Channeling (RBS/C), Nuclear Reaction Analysis (NRA), Proton Induced X-ray Emission (PIXE) and Elastic Recoil Detection Analysis (ERDA). HIA is operated to support Australia's only experimental nuclear physics program, a major accelerator mass spectrometry program and facilities for ion-beam modification and analysis of materials, and for undergraduate, postgraduate and postdoctoral training. As accelerator operations involve the handling of radioactive materials, the use of sealed and/or unsealed radiation sources, and operating equipment that produces radiation, there are safety hazards to personnel.</p> <p>Observations</p> <p>In general, the Research School of Physics and Engineering (RSPE) demonstrated safety in the operation of the accelerator facilities. The inspection consisted of discussions with ANU representatives, review of safety documentation, and physical inspection of facilities work areas.</p> <p>In relation to RSPE configuration control, the review and update of plans and arrangements for safe operation of the RSPE accelerators has not always been effective. Safety documentation did not accurately describes all hazards specific to accelerator work-related activities. Examples include:</p> <ul style="list-style-type: none"> • Safety documentation did not contain a list of hazards specific to the accelerator work-related activities, such as the hazards associated with the beam magnets, nor the hazards associated with gantry cranes used in accelerator related work activities. • Safety documentation did not contain detailed hazard control measures and precautions specific to the accelerator work related activities, such as general safety checks after re-configuring a particular accelerator beam line, or removing the tag from the HIA tower gantry crane before use. 	

- Safety documentation did not contain a measure of severity of harm attributable to the kinds of hazards present in the accelerator facilities.

In relation to accelerator worker competencies and training, there was room for improvement with respect to authorisation of persons involved in accelerator work related activities and the currency of training material. Examples include:

- Whereas authorisation of RBS and HEI workers was clearly documented, authorisation of HIA workers was not.
- Training and competencies required to operate the 5T gantry crane and HIA tower gantry crane were not clearly described in the safety documentation.
- ANU Ionising Radiation Safety course material contained information that was out of date, such as a reference to ARPANSA safety codes and standards current as at 2011 and radiation exposure data compiled in 1999.

In relation to emergency preparedness, RSPE has not always been attentive in implementing up to date ANU emergency procedure requirements. Examples include:

- ANU Ionising Radiation Safety course material in states Regulatory Authority in the ACT as the contact for emergency response, instead of the current Commonwealth Regulator ARPANSA.
- ANU representatives informed inspectors that the most recent building evacuation in relation to the HIA was approximately 18 months ago, although the ANU emergency procedures stipulate an emergency exercise of at least annually.

The following strengths were identified during the inspection:

- Exposure records indicate doses are As Low As Reasonably Achievable (ALARA) and well within annual dose limits.
- Bimonthly functionality checks and testing of radiation safety related interlocks and monitoring equipment was conducted thoroughly, completed in a timely fashion and documented.

Findings

The licence holder has taken reasonable steps to comply with the Act, applicable regulations, and licence conditions. ANU's performance may be improved by addressing the following deficiencies:

Performance Deficiencies:

1. Review of plans and arrangements for safe operation of the accelerators has not been effective in ensuring accelerator safety documentation accurately describe all hazards specific to accelerator work related activities.
2. In some instances, worker authorisation records were not always clearly documented and training material was not up to date.
3. RSPE has not always been attentive in implementing up-to-date ANU emergency procedure requirements.

Factual content of report agreed via telephone with Head of School at 12.30 on 11/9/2015

No written response to this report is required.

It is expected that actions to address any performance deficiencies will be taken in a timely fashion.

This report will be published on the ARPANSA website

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