



**Australian Government**

**Australian Radiation Protection and Nuclear Safety Agency**

## INSPECTION REPORT

<b>Licence Holder:</b> ANSTO – Bragg Institute	<b>Licence Number:</b> S0171
<b>Location inspected:</b> Neutron Guide Hall and Reactor Beam Hall	<b>Date of inspection:</b> 2-5 February 2016
	<b>Report No:</b> R16/01096

An inspection was conducted under Part 7 of the Australian Radiation Protection and Nuclear Safety Act 1998 (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.

The scope of the inspection included an assessment of ANSTO – Bragg Institute ('the Bragg Institute') performance based on the source licence Performance Objectives and Criteria. This inspection focussed upon the activities conducted during hot commissioning. The inspection consisted of a review of records, interviews, and a physical inspection of the neutron beam instruments.

### Background

A suite of neutron scattering instruments is located adjacent to the OPAL reactor. These are managed by the Bragg Institute with the aim of providing the Australian and international scientific community with the capacity to perform experiments in the pursuit of scientific breakthroughs.

The instruments are licensed in a phased manner. The first stage is authorisation to conduct 'hot commissioning'. During this, the licence holder confirms that the radiation dose rates surrounding the instrument are consistent with the design, and modifications to the shielding are made when needed. Furthermore, the interlocks controlling access the instrument enclosure are tested to confirm that they perform their safety function. At the conclusion of this process, the results of the tests and measurements are provided to ARPANSA to support a request for authorisation to operate the instruments.

### Observations

In general, the arrangements in place to manage the hot commissioning of the neutron beam instruments at Bragg Institute are mature and relatively consistent with ARPANSA's source licence Performance Objectives and Criteria. In some cases, however, there appeared to be room for improvement.

One area for improvement is performance reporting and verification. It was observed that an ANSTO site wide system is available to identify and manage actions associated with safety events or identified during safety inspections. It was verified that this system is used by the Bragg Institute. However, the inspection found that ANSTO is in the process of implementing a new system across the entire site which will incorporate this function. The current action tracking system is not consistently used to manage issues from identification through to completion (for instance, the modification of the BILBY instrument following the identification of higher than expected dose rates occurred outside this system). Furthermore, actions originating from some events were found to be tracked locally. For example, an event (14/892) was investigated using the appropriate ANSTO forms but it has not been logged in the electronic tracking system. The actions arising from the event were implemented.

Another area for improvement is configuration control. ANSTO has a Business Management System (BMS) that applies to all sources and facilities at the site. Further to this, the Bragg Institute has developed their own BMS which is specific to the OPAL Neutron Beam Facility. A sample of the documents from within both BMS was reviewed. It was identified that some of the current practices do not strictly follow the requirements as documented.

For example, ANSTO has set the frequency for reviewing documents within the BMS. This is set out in AR-1041 as being generally three years. However, there is the exception that it may be extended to five years for some documents. Since the Bragg Institute has not formalised which documents are to be reviewed on a five-yearly basis, it is considered that a review interval of three years is applicable.

Although the majority of the BMS documents have been revised within the applicable period, some procedures and instruction have not been updated since 2011 or 2012. For example, the last review of the Safety Management Procedure (PO-P-017) was conducted in 2012, and consequently, some of the information contained in the procedure was found to be not current.

Another BMS procedure Radiation Monitoring for the Bragg Institute (PO-P-020) requires that hard copies of relevant quarterly survey records are placed outside each instrument enclosure. Evidence showed that the periodic radiation surveys have been carried out. However, upon physical inspection it was identified that not all these survey reports are displayed on instrument enclosures.

Performance improvement is the identification of learning opportunities from within or outside the licensee's organisation. An area where ANSTO has not recognised an opportunity to enhance safety is the review of the Safety Interlock System (SIS). The SIS is used to make an area safe, when needed, by closing shutter(s) and stopping the flow of neutrons. Safety within the Bragg Institute relies heavily upon the bespoke SIS that is in place. An international benchmark of similar facilities was conducted prior to the Bragg Institute commissioning the first neutron beam instrument at the OPAL reactor. Based upon this exercise, ANSTO designed the SIS with the aim that it would be the best of its type in the world. However this benchmarking exercise has not been repeated since. Therefore ANSTO has not evaluated whether the SIS can, or should, be improved to reflect technological improvements and developments that have occurred at similar facilities overseas.

## Findings

The licence holder's compliance with the Act, applicable regulations, and licence conditions has been reviewed. The available evidence indicates that the Bragg Institute has complied with all relevant requirements. Performance, however, may be improved by addressing the following performance deficiencies:

### Performance Deficiencies:

- 1) The Bragg Institute has not tracked actions identified from safety events and safety inspections in a consistent manner.
- 2) Some of the Bragg Institute processes as set out in the BMS are not always followed.
- 3) The SIS has not been formally benchmarked against other facilities since September 2006.