



INSPECTION REPORT

Licence Holder: Australian Nuclear Science and Technology Organisation (ANSTO)	Licence Number: F0157
Location inspected: OPAL Reactor at Lucas Heights Science and Technology Centre, Sydney	Date of inspection: 18 January 2012
	Report No: R12/01705

This is the record of an inspection 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, the Australian Radiation Protection and Nuclear Safety Regulations 1999 (the Regulations), and F0157 licence conditions.

The scope of this inspection was to review the management of ‘events’ at the 20MW OPAL reactor. ARPANSA regards an event as an unplanned occurrence or outcome which has caused, or has the potential, or which may be perceived to cause consequences that could affect safety or cause harm to the environment. Generally, events have relatively low direct safety consequence but they can offer early warnings for more severe incidents and accidents and provide good opportunities for organisational learning. ANSTO has arrangements for dealing with events within the OPAL integrated management system known as the BMS. ANSTO is required under ARPANS Regulation 49 to comply with these arrangements. The purpose of this inspection was to assess how well ANSTO deal with the events that occur, and how well they learn from the experience of those events so that safety is progressively improved.

Two ARPANSA inspectors attended the inspection which was undertaken by reviewing operational records and talking with ANSTO staff. The inspection sought information on the status of a number of events. The management of two events was investigated in detail.

Findings:

The OPAL event management system provides a good framework for event management and organisational learning. There is a good level of reporting in the system by OPAL Staff.

An event reviewed in detail concerned a failure of an electromagnetic coupling of one of the control rods. The safety function of the components was fulfilled, and the safety of the reactor was not compromised. It was found that log records did not provide sufficient detail to determine how the event was managed by operating staff. As a result it is recommended that ANSTO review the adequacy of its log keeping practices. The scope of the event report was restricted to engineering aspects, and did not include any commentary on the actions taken by operating staff in dealing with the actual event that was not fully covered by standard operating instructions. It was found that the actions of operating staff were appropriate, but, as a general rule, ANSTO should expand the scope of investigations to maximise organisational learning to enhance staff performance, staff training and improve procedures and instructions.

A review of the corrective actions taken to repair the electromagnet and replace damaged water seals indicated that the repair has been successfully accomplished. However, the development of the instructions for this process deviated from the approved change control processes. It is important for safety that the management system is followed or, where found not to meet operational requirements, is updated accordingly with regard to radiation and nuclear safety. ANSTO staff agreed to review current practices. Inspectors made a number of comments on differences with the structure and content of the ANSTO instructions from accepted best practice.

Inspectors were informed that reactor system security arrangements are currently being reviewed in response to several instances where instrumentation and control systems had been accessed by OPAL

technicians without the proper prior authorisations being in place. It is recommended that ANSTO considers introducing regular refresher training on the importance of following proper protocols.

A review of lessons learned and the implementation of corrective safety actions identified that the degree of learning from events was variable. Whilst events are often closed when corrective actions are initiated or planned, there can be a long delay before the corrective action is implemented. In the intervening period ANSTO often relies on enhanced checks and inspections, the effectiveness of which is known to reduce over extended time periods. There is also currently no effective tracking system for the implementation of corrective actions identified from events.

Most events have a human contribution either as a contributing cause or in the subsequent management of the event, but the attention given to human factors appeared to be variable. Inspectors were told that all safety and environmental events were sent to ANSTO Safety Environmental and Radiological Assurance Section (SERA) who can undertake a specialist assessment of human factors. However records did not support this in all cases, and a number of other events that had been categorised as operational events were considered by inspectors to have broader safety implications. Inspectors recommended that SERA take a proactive role in verifying good event investigation practices across ANSTO.

Conclusions:

The current Reactor Operations Event Management System (ROEMS) operated by ANSTO provides a good framework to assist organisational learning. There appears to be good reporting for the OPAL system, but there is considerable variation in the application of the system afterwards, particularly in the level of root cause analysis applied, the adequacy of lessons learnt and the time taken to fully implement corrective actions.

At the time of inspection, there was some degree of deviation from formal change control processes during the development of corrective measures by the OPAL Engineering and Maintenance Section for the control rod seal repairs. This was not considered to be a significant non-compliance since there was no evidence of a repeated pattern. Strong leadership is needed to ensure that the BMS (an important part of the OPAL Plans and Arrangements for managing safety) is not only followed but is maintained to safely reflect changing operational requirements.

Recommendations:

- ANSTO should review the adequacy of log keeping noting that the International Atomic Energy Agency (IAEA) states that; “*log books should contain a narrative of plant status and of all events and should record the data that are necessary to maintain an accurate account of plant operation*”;
- ANSTO should review the scope of operating instructions for their coverage of common operational deviations;
- ANSTO should include the evaluation of operating staff actions in response to breakdown of engineered systems to provide insight and learning opportunities for human performance and the adequacy of procedures and instructions;
- ANSTO should undertake a review of the format and content of technical procedures and instructions to ensure that they meet standards of best practice;
- ANSTO should consider implementing refresher training for maintenance and engineering staff to reinforce BMS compliance and documentation practices;
- SERA should take a proactive role in ensuring that ANSTO promotes good practices and an appropriate consideration of safety across all categorisations of events;
- ANSTO should review the current practice of closing events before associated corrective measures are fully implemented.