



Australian Government

Australian Radiation Protection and Nuclear Safety Agency

INSPECTION REPORT

Licence Holder: ANSTO	Licence Number: F0184
Location inspected: High Flux Australian Reactor (HIFAR)	Date/s of inspection: 20-23 September 2016
	Report No: R16/11182

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 1999 (the Regulations), and conditions of Facility Licence F0184.

The scope of the inspection included an assessment of HIFAR's performance against the Performance Objectives and Criteria (PO&Cs).

Background

F0184 is a licence held by ANSTO for the Possess or Control of the High Flux Australian Reactor (HIFAR). HIFAR was Australia's first nuclear reactor, built at Lucas Heights by the Australian Atomic Energy Commission Research Establishment (later ANSTO). HIFAR was a tank reactor that was fuelled with enriched uranium and cooled and moderated by heavy water. There is also a graphite neutron reflector surrounding the core. HIFAR was built as a nuclear materials testing reactor but was later used extensively for neutron beam research, production of neutron transmutation doped (NTD) silicon, and for production of medical and industrial radioisotopes.

HIFAR was permanently shut down in 2007 and was subsequently defueled and the heavy water removed.

The licence requires ANSTO to care and maintain the facility so that radiation risks are appropriately managed before it is eventually dismantled during decommissioning. ANSTO may undertake activities to characterise the facility and plan for its decommissioning. Decommissioning is not permitted under the possess or control licence.

Observations

Generally the facility was found to be in good condition. The reactor containment building which houses the reactor block was found to be tidy and well maintained. A number of maintenance and refurbishment projects were in evidence including the removal of asbestos floor tiling. A characterisation project to determine radioactivity levels in the reactor block was taking place during the inspection. The radiation safety aspects of this project were well controlled.

It is noted that the inspection was conducted at a time when the facility was undergoing a period of change. The HIFAR facility has recently been transitioned under the Nuclear Services group and a review of effective control has been initiated. Some areas for improvement identified by the Inspector team had recently been self-identified by ANSTO and corrective actions were already being progressed at the time of the inspection.

The inspection findings are listed below :

- **HIFAR Quality Management System**

The HIFAR Quality Management System (HQMS) comprises plans, procedures and instructions that provide requirements for the safe management, care and maintenance of the facility. ANSTO is required to have plans and arrangements in place and to ensure that these plans and arrangements are implemented to the extent reasonably practicable. ANSTO is expected to maintain the configuration of the controlled facility in accordance with procedures and instructions. Change management is expected to be used when making changes to plant equipment, operating processes and management arrangements. A number of problems were found with the HQMS, which collectively indicate that it has not always been properly maintained and is intermittently followed. Inspectors requested the latest version of a sample of HQMS plans, procedures and instructions.

A number of documents were found to be in draft form, sometimes for several years. ANSTO explained that staff with significant experience at HIFAR did not need to make use of procedures when conducting routine work. They either used manuals or did the work without the relevant procedure. ANSTO also stated that some procedures were rarely used and would be revised once they were needed. In these cases, the documentation would remain in draft whilst the work was completed and then the procedure issued retrospectively, with any amendments required. Some documents were also erroneously marked to be in draft.

The use of draft documentation is not in conformance with The HIFAR Quality Protocol Statement (NH01A) or the HIFAR Document Control and Preparation Procedure NHP 5.1. It is also not in line with accepted best practice for quality.

Examples included:

- Plant, maintenance, operations and project records (nhei9.3.10.10)
- B15 shell external inspection (nhei9.3.10.16.3.1)
- routine tests and checks on the HIFAR facility (nhoi9.2.18.2)

There were examples of safety significant documents for which the review and approval had been conducted by the same person. This is not in compliance with the HIFAR Documents Preparation and Control Procedure NHP 5.1 requirements.

Examples included

- Documents Preparation and Control – ANSTO Document Number NHP5.1
- Plans for the Safe Storage of Controlled Material and Maintenance of the HIFAR Facility ANSTO/06/749/2/FP-8
- Safety Management Plan for the HIFAR Facility ANSTO/06/749/2/FP-2
- Radiation Protection Plan for the HIFAR Facility Document Number ANSTO/06/749/2/FP-3 (Rev. 2)

However it is noted that an update to plans and arrangements in September 2016 has been signed off by separate reviewers indicating that the problem has been identified by ANSTO. It was found that an ANSTO security advisor had reviewed the current Security Plan and had advised that there were issues with the current document which they could assist in addressing at a later date.

Configuration Management - Application of change control

At the time that the HIFAR licence was issued, ANSTO included a requirement for a major structural survey every five years in its Plans for the Safe Storage of Controlled Material and Maintenance of the HIFAR Facility – ANSTO/06/749/2/FP-8 Rev 0. ANSTO removed this requirement from the plan at Rev 1 in August 2012. The change record for the document reflects only organisational and format changes.

ANSTO advised that it assesses this change to fall under Regulation 52 on the basis that the “requirement” for the structural survey is contained in IAEA Safety Report Series No.26, which is referenced from the ANSTO Plan and therefore the requirement was not removed. It is noted however that the ANSTO plan does not mandate compliance with the IAEA report. Further the IAEA report only refers to the structural survey as an example component of a surveillance plan.

ANSTO has provided evidence that a structural survey was undertaken in 2014. The report provided (Revolution Safety 15 Sept 2014) showed the survey was undertaken as part of preparation of a painting job (the exterior of the B15 containment building) and focussed on the external monorail only.

Further information was also provided via email on the 23 September by the HIFAR manager stating that the scope of the survey had also covered the full external area of the HIFAR building. This scope and these results were not included in the final report. No internal structures were reviewed.

At this stage, based on the evidence provided, it does not appear that a major structural survey has been conducted on the HIFAR reactor as required in the Plans and Arrangements within the past five years. Inspectors therefore consider that there is a potential non-compliance with Regulation 49.

There were other examples of changes which have occurred but which have not been reflected in an update to the documentation. These changes indicate that work practices have drifted away from internally approved methods but there is no evidence that ANSTO have followed their internal change control processes and conducted an assessment on the safety implications of the changes.

Examples include:

- **Routine tests and checks on the HIFAR facility (nhoi9.2.18.2)** –This procedure requires daily routine checks on the facility with an appended check sheet. This check had not been completed on a daily basis for a number of years. A different routine check sheet was provided as evidence to show that some checks were being completed periodically but this did not appear to be part of the HIFAR QMS. No change control paperwork had been completed to reflect the safety significance of altering the frequency of the tests and checks.
- **HIFAR Radiation Safety Management NHP9.2.21** – Conformance with the procedure is stipulated in the HIFAR Radiation Protection Plans and Arrangements. It specifies the frequency and type of health physics surveys to be conducted. In the first two quarters of 2016 this schedule was not met due to lack of resources. ANSTO identified the problem and have implemented corrective actions. However, no change control paperwork was completed by HIFAR management to reflect the safety significance of temporarily altering the frequency of the survey.

Inspection Maintenance and Testing

The management of a contracted drilling team who were conducting characterisation work was observed to be in line with ANSTO internal contractor supervision documentation. The appropriate radiological risk assessment paperwork, procedural use and tool box talk evidence was sighted. ANSTO's contractor management and safety protocols were reported to be of a high standard by the contractors conducting the work.

Training

It was noted that the NHP18.1: Training Management Rev 4 was under review and that plans to develop and expand the curriculum further by the HIFAR project training officer were commendable.

Training records to demonstrate that two facility management members who conducted routine work at the facility, had completed the HIFAR induction could not be located upon request. However, an internal assessment conducted recently had resulted in an action to address management of training records.

Emergency Management

Inspectors noted that there has been a recent security and safety combined exercise conducted at HIFAR and that annual exercises have been planned in the future and recorded on the SAP system. The integrated approach to the exercise was considered to be commendable.

Findings

The inspection revealed the following potential non-compliance:

A requirement to conduct a major structural survey is stipulated in the Plans for the Safe Storage of Controlled Material and Maintenance of the HIFAR Facility – ANSTO/06/749/2/FP-8. Based on the evidence provided, ARPANSA inspectors are not satisfied that a major structural survey has been conducted on the HIFAR reactor as required in the Plans and Arrangements. Inspectors consider that this is a potential non-compliance with Regulation 49.

Regulation 49 requires the holder of a licence to take all reasonably practicable steps to manage the safety of the facility, including having and implementing plans and arrangements for managing safety.

At the time of the inspection it appeared that the plans and arrangements relating to conducting a major structural survey had not been implemented to the extent reasonably practicable.

The inspection also revealed the following **Areas For Improvement (AFI)**:

AFI 1 - HIFAR Quality Management System –

Inspectors found evidence that the HQMS has not always been effectively maintained. A number of documents comprising the HIFAR quality management system were found to be in draft at the time of the inspection. Some documents have been in draft form for several years. There were also examples of safety significant documents where the review and approval had been conducted by the same person. This is not in compliance with the HIFAR Documents Preparation and Control Procedure NHP 5.1 or best practice in quality management.

AFI 2 – Configuration Management - Application of change control

Some changes to the methods used to care and maintain the HIFAR facility have been implemented without appropriate use of the ANSTO change control process. No documentation could be produced to reflect the impact of these changes on safety margins.

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