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HIFAR Facility Licence Application Part B(2)

Document ANSTO/06/749/2/FP-2



SAFETY MANAGEMENT PLAN FOR THE HIFAR FACILITY

(REV. 0)

Prepared By

Australian Nuclear Science and Technology Organisation

May 2007

Australian Nuclear Science & Technology Organisation
 Safety Management Plan for the HIFAR Facility (rev. 0)

REVISION SHEET		Document ANSTO/06/749/2/FP-2			
		Print name, date and sign or initial			
Revision Number	Description of Revision	Prepared	Checked/ Reviewed	Approved	Agreed
0	Original issue	Simon Bastin	Moazzem Hossain Pertti Sirkka	John Rowling	Con Lyras

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1 PURPOSE AND SCOPE

This plan outlines the safety management system, including responsibilities, policies and procedures that are in place within ANSTO, to assure that all activities to be carried out at the HIFAR Facility during the period that this licence remains in force are safe and in compliance with regulatory requirements.

This Plan has been prepared for the safe management of the facility and as part of the Possess or Control Licence Application to replace the existing HIFAR Operating Licence following the permanent shutdown of the reactor (refer to Part A of this licence application for further details).

This Plan should be read in conjunction with other plans, specifically those relating to radiation protection, emergency arrangements and waste management (provided as part of this Licence Application).

2 RESPONSIBILITIES

ANSTO, as the licence holder, has responsibility for the management of the HIFAR facility. The Executive Director of ANSTO has delegated responsibility for the safe management of HIFAR to the General Manager, Technical Services and Facility Management (TS&FM) during the period that this licence remains in force. The Operating Organisation for this period with roles, responsibilities and lines of communication of key personnel is described in detail in the Effective Control Plan.

The General Manager, Technical Services and Facilities Management is the Licence Nominee for HIFAR and has overall responsibility for the maintenance of and safety of activities undertaken in HIFAR at all times, consistent with ANSTO policies and general arrangements. The Nominee is delegated to make, amend or vary the application in the name of ANSTO, pursuant to paragraph 34(a) of the ARPANS Act 1998 and regulation 39 of the ARPANS Regulations 1999.

The General Manager, Technical Services and Facilities Management has delegated responsibility for implementing these Plans to the Facility Manager. The Facility Manager is responsible for planning and managing resources to ensure the safety of activities undertaken in HIFAR and the effective maintenance and control of HIFAR (TSFM Procedure DHF 001 – “Quality Management Planning – De-fuelled HIFAR Facility” [1] and Procedure NHP 1.2 – “Organisation, Responsibilities and Authority” [2]).

3 SAFETY MANAGEMENT SYSTEM

ANSTO has safety management arrangements and procedures for all activities and dealings under its control. These arrangements and procedures protect human health and the environment, and promote continual improvement in safe working practices in the workplace. This commitment is in accordance with ANSTO strategic policy, as set out in the ANSTO Health, Safety and Environment Policy (APOL 2.1). APOL 2.1 also commits ANSTO to ensuring that values such as safety and environmental awareness are integral to, and a priority in, all operations.

Implementation of the HIFAR Facility safety management arrangements and other local (HIFAR) procedures is in accordance with the ANSTO Safety Management System. The system is detailed in various “ANSTO OHSE Standards and Practices” which are disseminated to all staff. The OHSE Standards are issued by the Executive Director, whilst the OHSE Practices are set by custodian divisions with specialist knowledge. These arrangements inform staff of health and safety requirements for compliance, as necessary. The Safety Management System ensures that hazards are identified and their risk is managed so that all activities are conducted safely by providing a framework for:

- Minimising the likelihood of incidents or accidents;
- Managing radiation protection and occupational health and safety;
- Protecting human health and the environment; and
- Promoting a positive safety culture.

This regime gives assurance that all operations continue to be conducted safely and in a manner that is consistent with regulatory commitments.

The applicable arrangements and procedures are discussed below under the following Sections/Sub-sections.

HIFAR has Service Level Agreements (SLAs) with ANSTO's Safety and Radiation Services, which provides services in the areas of radioactive waste management, radiation protection, systems safety and other areas, as needed, for the planned activities within the HIFAR facility.

The existing HIFAR procedures and arrangements are listed under Requirement 8 (Organisational Plans and Arrangements) in the draft Document Index [3].

3.1 Scope of the Safety Management System

The primary aspects of the ANSTO safety management system are associated with:

- safety approval and monitoring;
- nuclear safety;
- radiation protection;
- emergency response and planning;
- event reporting and investigation;
- occupational health and safety; and
- fire safety.

These aspects are applied to the activities undertaken within HIFAR as detailed in the HIFAR QMS. Nuclear safety is, of course, not relevant to HIFAR during the period that this licence remains in force.

In addition to regulatory requirements imposed under the ARPANS Act, conventional occupational health and safety of operations in HIFAR are regulated by COMCARE. For potential hazards where no Commonwealth regulation exists, ANSTO has undertaken to comply with relevant State standards. Such standards include pressure vessel standards, fire safety, chemical safety, cooling tower standards and safety of lifting equipment.

ANSTO also complies with regulatory requirements for aqueous and airborne discharges from site.

3.2 Elements of the safety management system

The main features of ANSTO's safety management system, as it pertains to HIFAR during the period that this licence remains in force, are:

- The ANSTO Health, Safety and Environment Policy (APOL 2.1) which commits ANSTO to safe operation of facilities, and emphasises the priority given to safety. This policy is located on the intranet and is readily understood by staff.
- APOL 2.1 is supported by a series of OHSE Standards and Practices covering OHSE Management, Risk Management, Chemical Safety, Contractor Safety, Electrical Safety, Emergency Planning, Environmental Management, Manual Handling, Nuclear and Radiation Safety and Occupational Health and Safety.
- Clear, unambiguous lines of responsibility in safety matters. ANSTO OHSE AS2300 - *OHSE Management Standard* clearly spells out that responsibility for safety rests with the line management of the source, facility, laboratory, or office. The Safety delegations are defined in APOL 2.1 D 01. AG2362 - *Occupational Health, Safety and Environmental (OHSE) Responsibilities* sets out the OHSE responsibilities of specific roles. Individual employees are responsible for undertaking their activities in a safe manner and are encouraged to take a proactive approach to safety matters.
- A formal safety assessment and approval system as set out in ANSTO OHSE AS 2301 - *Risk Management*. This describes the review process that takes place before operation of plant and

the monitoring process that gives assurance that the plant is being operated safely. The system comprises:

- the Safety Assessment Committee (SAC), which has an external member, and is the internal body for assessing and approving all activities (other than those that have a minor hazard); and
- the Environmental Monitoring Committee (EMC), which oversees the monitoring of all solid, liquid and airborne discharges and any operations with potential off-site effects.
- The terms of reference for each committee as outlined in *OHSE Review Committees – Terms of Reference Guide* (AG2365).
- A system for providing adequate induction and supervision of contractors as set out in OHSE Standard AS2303 – *Contractor Safety*.
- A system of permits for working in hazardous areas as set out in the *Safe Working Permit Guide* (AG2408).
- A system for the control and categorisation of modifications as set out in Safety Directive 2.2.
- An event reporting system that emphasises and facilitates learning from errors. ANSTO operates both an internal and an external incident reporting system, as described in the *Event Reporting Guide* (AG2372). This provides a staged process of notification (depending on the severity of the incident) and requires that incidents are investigated, corrective actions implemented, and that lessons on technical and human factor aspects of the incident are learned from the incident (AG2375).
- Specific controls for radiation protection, as set out in the *Radiation Safety Standard* (AS2310), and a policy of "As low as reasonably achievable", as described in *Risk Assessment and ALARA Cost Benefit Guide* (AG2506).
- Specific requirements for *Electrical Safety* (AS2304), chemicals (AS2302), and entry to, and work in, confined spaces (AG2401). Specific approvals are required for pressure equipment (AG2501 and AG2503) and Lifting equipment (AG2497).
- All staff are required to attend a safety induction course as per ANSTO's Safety Training Guide (AG2363) and Safety Course and Retraining Requirements Guide (AG2364).
- Specialised training in areas such as radiation protection, confined space entry, safety auditing, which is provided on an as-required basis, as outlined in AG2364.
- Safety performance is monitored through management review of incidents and key performance indicators for safety. In addition, safety is considered at each ANSTO management meeting.

3.3 Safety Review and Approval

No ANSTO activities (including changes to activities) may be undertaken without a hazard identification and risk assessment. If the hazards are only minor, then the activity may be approved by line management. For activities involving hazards that are not minor, prior approval by the Safety Assessment Committee is required, as set out in ANSTO OHSE AS 2301 - *Risk Management*. The SAC utilises safety specialists of various disciplines (depending on the hazards involved in the proposed activity) to assess the proposed activity and make recommendations as to whether the activity should be approved and if so, under what conditions if any. The committee makes a decision, with or without conditions, taking into account the advice of the assessors.

3.4 Safety Culture

HIFAR management, through the safety management system, encourages ongoing minimisation of safety risk and the implementation of appropriate safe behaviour. Activities at HIFAR are undertaken under the guidance of the HIFAR management in accordance with the documented procedures as amended within the QMS. Personnel are trained and assessed for their specialist skills, and are encouraged to take responsibility for ownership of safety. Open communication and use of the Safety Review Meetings enable staff to report safety concerns and contribute to effective solutions. Human factors analysis and task analyses are an integral part of the safety management system.

[AS 2310 - ANSTO OHSE Standard - Radiation Safety](#) commits ANSTO to enabling a positive safety culture that guides the attitudes and behaviour of all individuals in the realisation of the radiation protection objectives. To achieve this, ANSTO ensures sound management practices; good engineering and laboratory practices; attention to quality assurance, training and qualification of personnel; implementation of a comprehensive safety assessment, monitoring and review system; and feedback from lessons learned from experience and research.

3.5 Competency, Training and Supervision

Arrangements are in place for the training and any subsequent retraining of all personnel involved with HIFAR. Training and accreditation of personnel is completed using a combination of theory and practical methods. All activities associated with HIFAR are documented within the QMS.

Specific safety competency is provided through training outlined in AG 2363 *ANSTO Safety Training*. This includes training provided by Safety & Radiation Services division that relates to specific requirements of legislation or to provide competency in dealing with specific hazards. All accredited persons are issued with documentation that confirms their achievement and are documented in the Registrar database for future reference and to schedule retraining as required.

Once approved, changes to QMS documentation are communicated to staff and supported by appropriate training where necessary, in accordance with HIFAR QMS.

3.6 Safety of Non-ANSTO personnel

Arrangements are in place to ensure that all visitors to HIFAR are informed of hazards and are under the supervision and escort of a HIFAR pass-holder at all times. Arrangements covering visitors to the site are set out in AG 2384 *Information for Visitors*.

Non-ANSTO personnel entering HIFAR to conduct work of any kind are required to undergo induction training in accordance with AG 2364 *ANSTO Safety Courses and Retraining Requirements (Guide)*. Induction training includes assessment. These contractors are then supervised by the Contractor Supervisor in accordance with AG2362 - *Occupational Health, Safety and Environmental (OHSE) Responsibilities*. Contractor Supervisors are responsible for appropriate supervision commensurate with the HIFAR area and the type of LHSTC pass.

The criteria for the selection of contractors are based on past performance, accreditation to ISO 9001 and other relevant issues, as specified in the QMS.

3.7 Control of Hazards

HIFAR hazards are identified and categorised in accordance with the OHSE Management System, as described above. Safety analyses are performed for all potentially hazardous activities, in accordance with the safety management system outlined above. Identified risks are prevented or mitigated through the use of the hierarchy of controls.

During the period that this licence remains in force, the hazards present are predominantly of a conventional industrial and occupational nature, rather than a nuclear or radiological nature. There are no nuclear hazards in HIFAR. Specific controls for radiation protection are in accordance with the ANSTO policy outlined in OHSE AS2301 and implemented through the application of AG2471, AG2508, AG2509, AG2510, AG2511, AG2512, AG2513, AG2514, AG2505 and AG2506 and a number of HIFAR QMS instructions [3]. These documents, together with the Radiation Protection Plan and the HIFAR SAR, outline ANSTO's commitment to the safety of the activities to be undertaken in HIFAR during the period that this licence remains in force.

HIFAR Area Supervisors are appointed for designated hazardous areas, as outlined in AG2362 - *Occupational Health, Safety and Environmental (OHSE) Responsibilities*. An Area Supervisor is a local delegate of management who is authorised to address health, safety and environment concerns in their designated hazardous area. Area Supervisors endorse 'Safe Work Permits' for work of a temporary nature (e.g. maintenance, inspection or repair work) in designated hazardous areas in consultation with S&RS and/or TS&FM staff if necessary.

- Activities will also be reviewed as part of the reporting system, as described in AG2375 *Investigating Events (Guide)* and HIFAR Procedure, NHP 9.2.26 (*Abnormal Occurrence Reports and Operating Occurrence Reports*) (see below).

Operational events and deviations are reported, investigated and rectified through the HIFAR AOR system and non-conformance reporting system of the HIFAR QMS (depending on the type of event).

3.8 Workplace Consultation

Consistent with APOL 2.1, activities at HIFAR are undertaken in a manner that places the protection of human health and safety and environment as its highest priority. A positive safety culture and environmental awareness are promoted throughout all levels of the organisation. Staff are empowered to have ownership of their safety and are encouraged to strive for continual improvement in safe work practices and the reduction of any environmental impact. Activities are undertaken in a manner that facilitates continual learning from experience.

3.9 Event Reporting and Investigation

HIFAR Procedure NHP 9.2.26 (*Abnormal Occurrence Reports and Operating Occurrence Reports*) is used to identify, assess and categorise events and recommend appropriate corrective actions, if required, to prevent recurrence. The categorisation is done generally in accordance with the International Nuclear Event Scale (INES) [4], as applicable. The Procedure has provisions for recording the events, analysing the root cause, recommending corrective/preventive actions and also providing requirements and guidance for reporting an event to the line management (and others within ANSTO) and ARPANSA based on the categorisation (i.e. severity) of the occurrence.

Although the aspect of nuclear safety is not relevant to the HIFAR facility during the possess and control period, the above Procedure will continue to be used, as applicable, to address the aspects of radiation safety or exceedance of any operational notification limits. However, the above Procedure will be amended in future, as required.

Procedure NHP 9.2.26 has provisions for notifying ARPANSA within statutory timeframes, depending on the kind of event. Such provisions will continue during the period that this licence remains in force. Reports are made on all HIFAR events and anomalies, whatever the cause. These reports are investigated thoroughly by trained personnel.

NHP 9.2.26 is consistent with the ANSTO event response system that is outlined in AG 2375 *Investigating Events (Guide)*. This requires the immediate reporting of:

- All events arising from the operation and use of ANSTO's Controlled Apparatus, Controlled Material and Controlled Facilities.
- All accidents and incidents, whether work related, sustained whilst undertaking an endorsed sporting activity during an approved break, or during travel to and from work.
- All events of likely interest to either members of the public or external parties.
- All events that have the potential to reflect on ANSTO's position in the local community or more generally.

The event response system emphasises and facilitates learning from errors and requires that incidents are investigated, corrective actions implemented, and that lessons are learned from the incident.

Data collected from events and routine logs is reviewed regularly and trended for the purpose of identifying performance changes and possible need for corrective actions. Furthermore, such information is taken into account when planning future activities.

3.10 Audits and Reviews

Effective compliance with standards and regulations is achieved at HIFAR in accordance with the ISO 9001:2000 accredited QMS. Qualified auditors conduct auditing and review processes, both internal and external. Furthermore, safety assessment is a systematic process that is carried out throughout the life of the activity or facility to ensure that all relevant safety requirements are being met.

ALARA assessments are conducted in accordance with AG2505 *ALARA Assessment (Guide)* whenever doses are greater than 0.02 mSv/y for the public or 2 mSv/y for radiation workers.

Reviews of QMS documents are completed regularly in accordance with the ISO 9001:2000 standard. Any identified changes are incorporated after being submitted for independent review and approval.

Reviews and audits of Radiation Protection matters are addressed in the Radiation Protection Plan.

The Safety Assessment Committee undertakes audits of safety arrangements and compliance with the conditions of approval as per OHSE Guide AG 2436 *Conduct of SAC Audit (Guide)*.

3.11 Records

The activities of HIFAR, including training, incident reporting, investigation, audits and reviews are recorded in accordance with the HIFAR QMS and the ANSTO ABMS, as appropriate. These systems are both accredited under ISO 9001:2000.

4 SAFETY OF THE HIFAR FACILITY

The Safety Analysis Report (SAR) for the HIFAR facility [5] is Part C of this Licence Application. The SAR demonstrates that HIFAR can be maintained in a state of safe enclosure for the planned Possess and Control period, taking into account the activities planned for this period.

The SAR demonstrates that the radiological hazards are significantly reduced in this period when compared to the operational period, because the fuel elements and D₂O have been removed from the facility. Consequently, there are no criticality or nuclear safety issues involved, although radiological issues remain since the facility contains radioactive items such as the reactor block, pipework, the storage block, etc.

The facility will be maintained within a safe envelope as specified in the Limits and Conditions. These Limits and Conditions evolved from the set of Operational Limits and Conditions (OLCs) applicable to HIFAR in its operational period [6].

ANSTO will ensure that all activities at the HIFAR facility are at all times carried out in compliance with the applicable Limits and Conditions, and all operating procedures and instructions to be used for undertaking activities during the Possess and Control period shall comply with the applicable Limits and Conditions.

During the period that this licence remains in force, the following activities will be undertaken:

- several refurbishment projects systems (including replacement of HVAC);
- preliminary dismantling of redundant buildings, circuits and equipment;
- sample gathering for the purposes of radioactive inventory characterisation; and
- ongoing monitoring and maintenance

These activities are considered in the SAR [5] and are described in Part E of this licence application. For these activities, hazards were identified and the risks assessed. The safety analyses also considered the potential for external events and environmental impacts.

The analyses showed that the risks associated with the planned activities for HIFAR and the ongoing control of the facility do not extend beyond the facility. The analyses also showed that the risks are adequately low and able to be managed without any significant impact on people or the environment.

The planned refurbishment projects and preliminary dismantling will be managed according to HIFAR project management procedures, and implemented through submissions to ARPANSA (where applicable). These submissions will include safety assessments for the individual projects/tasks and will be made using existing HIFAR Procedures, based on the provisions of ARPANSA Regulations 51 and/or 52 and these will be internally reviewed as described in Section 3.3 above.

4.1 HIFAR Safety Review

In addition to the ANSTO committee structure detailed in section 3.3 above, HIFAR management holds a regular Safety Review meeting attended by HIFAR Line Managers and independent specialists.

The Safety Review meeting ensures that all activities to be undertaken during the period that this licence remains in force will be coordinated and have the necessary safety assessments.

5 INTERNATIONAL BEST PRACTICE

The safety management plan fits within the integrated ANSTO Business Management System, which is fully consistent with international best practice [7] in relation to the management system for facilities and activities. The plan is built on a framework that includes a series of OHSE Standards and Practices covering elements of safety management such as safety approval and monitoring, nuclear safety, radiation protection, risk assessment, safety culture, event reporting system, occupational health and safety etc. The plan also consists of specific procedures within the HIFAR QMS. The management responsibilities in relation to the safety management plan for its development, implementation, monitoring and review processes are in compliance with the IAEA guidance documents [8].

6 REFERENCES

- 1 TSFM Procedure DHF 001 (Rev. 0) – “Quality Management Planning – De-fuelled HIFAR Facility”
- 2 HIFAR Procedure NHP 1.2 (Rev. 11) – “Organisation, Responsibilities and Authority”
- 3 Index of Documents (Draft) demonstrating compliance with licence conditions
- 4 The International Nuclear Event Scale (INES), IAEA/NEA, Vienna, User’s Manual, 2001
- 5 Safety Analysis Report (SAR) for the de-fuelled HIFAR Facility (Rev. 0, 2007)
- 6 HIFAR Operational Limits and Conditions (NTD/TN 212)
- 7 International Atomic Energy Agency (IAEA), The Management System for Facilities and Activities, IAEA Safety Requirements No. GS-R-3, Vienna 2006
- 8 International Atomic Energy Agency (IAEA), Application of the Management System for Facilities and Activities, IAEA Safety Requirements No. GS-G-3.1, Vienna 2006