

Licence No: F0001

**AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY ACT 1998**

(Section 32; Reg 41)

**FACILITY LICENCE**

Pursuant to section 32 of the Australian Radiation Protection and Nuclear Safety Act 1998, the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (“ARPANSA”), hereby licenses:

**Australian Nuclear Science and Technology Organisation**

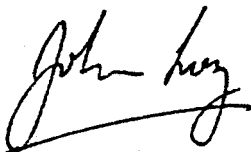
of New Illarawarra Road  
LUCAS HEIGHTS. NSW. 2234.  
(the “Licensee”)

to prepare the Site described in Schedule 2 hereto for the Controlled Facility described in Schedule 3 hereto, subject to the conditions, limitations and notes set out in Schedules 1, 4, 5 and 6.

This Licence comprises this page and the following Schedules:

- |            |   |   |
|------------|---|---|
| Schedule 1 | - | Interpretation                          |
| Schedule 2 | - | Site                                    |
| Schedule 3 | - | Controlled Facility                     |
| Schedule 4 | - | General Conditions                      |
| Schedule 5 | - | Special Conditions                      |
| Schedule 6 | - | Advisory Notes applying to this Licence |

ISSUED at SYDNEY, this 22nd day of September 1999.



**John Loy**  
CEO of ARPANSA

**Schedule 1**  
**Interpretation**

**1. Interpretation:**

1.1 In this Licence, unless the contrary intention appears:

“**Act**” means the *Australian Radiation Protection and Nuclear Safety Act 1998* (as amended from time to time);

“**Advisory Notes**” mean the advisory notes specified in Schedule 6 hereto;

“**ANSTO**” means the Australian Nuclear Science and Technology Organisation or the Licensee;

“**Application**” means the application for facility licence under the Act dated 13 April 1999 and submitted by the Executive Director, ANSTO; including and incorporating all attachments, annexures and schedules and documents referred to or relied upon therein;

“**ARPANSA**” means the Australian Radiation Protection and Nuclear Safety Agency;

“**Buffer Zone**” means the existing area surrounding HIFAR of approximately 1.6km radius, over which the Licensee has the authority to determine activities and safety requirements.

“**CEO**” or “**CEO ARPANSA**” mean the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA);

“**Experimental Guide Hall**” means that part of the Replacement Research Reactor Facility building that houses the neutron guides that are used for experiments;

“**Environment Assessment Report**” means the report prepared by Environment Australia, Department of Environment and Heritage (February 1999) entitled *Environment Assessment Report – Proposed Replacement Nuclear Research Reactor at Lucas Heights*;

“**Environment Australia**” means the Commonwealth Department of Environment and Heritage;

“**Facility**” and “**Controlled Facility**” mean the controlled facility, facility or facilities specified in Schedule 3 hereto;

“**General Conditions**” means the general conditions specified in Schedule 4 hereto;

“**Horoschun Report**” means the report prepared by Horoschun G, Department of Housing and Construction (September 1985), entitled *Seismic Review of the 100,000 Gallon Elevated Reservoir for AAEC Lucas Heights Research Laboratories*;

“**HIFAR**” means the High Flux Australian Reactor; a 40 year-old nuclear research reactor located at the Lucas Heights Science and Technology Centre and operated by ANSTO.

“**HIFAR Probabilistic Safety Assessment**” means the report prepared by Pickard, Lowe and Garrick (PLG) (1998) entitled *A Level 1+Probabilistic Safety Assessment of the High Flux Australian Reactor*;

“**Licensee**” means the Licensee specified on Page 1 of this Licence;

“**Lucas Heights Science and Technology Centre**”, means the Lucas Heights Science and Technology Centre, New Illarawarra Road, Lucas Heights. NSW. 2234;

“**Nominee**” means the natural person nominated by the Licensee in its Application who has appropriate responsibility together with adequate authority and control to ensure the safety of the Replacement Research Reactor Facility;

“**Preliminary Safety Analysis Report**” or “**PSAR**” mean the preliminary safety



analysis report referred to by the Licensee in the Application;

**“Principal Place of Business of the Licensee”** means the Lucas Heights Science and Technology Centre, New Illarawarra Road, Lucas Heights. NSW. 2234;

**“Regulations”** mean the Australian Radiation Protection and Nuclear Safety Regulations 1999 (as amended from time to time);

**“Replacement Research Reactor”** means the research nuclear reactor proposed and forming the integral part of the Replacement Research Reactor Facility;

**“Replacement Research Reactor Facility”** means the replacement research reactor facility including but not limited to the Replacement Research Reactor, associated buildings and supporting facilities as described and proposed in the Application;

**“SER”** means the Safety Evaluation Report prepared by ARPANSA for the CEO ARPANSA in connection with the Application;

**“Site”** means the site specified in Schedule 2 hereto;

**“Special Conditions”** means the special conditions specified in Schedule 5 hereto.

- 1.2 Any terms not defined in this Licence have the same meaning as applied to them in the Act, the Regulations and any further regulations made or prescribed under the Act.
- 1.3 Any terms not defined in this Licence, the Act, the Regulations and any further regulations made or prescribed under the Act, have the same meaning as applied to them under the SER.
- 1.4 Any terms not defined in this Licence, the Act, the Regulations and any further regulations made or prescribed under the Act, or the SER have the same meaning as applied to them under the Application.
- 1.5 Any terms not defined in this Licence, the Act, the Regulations and any further regulations made or prescribed under the Act, the SER, or the Application have the meaning as applied to them in the dictionary or under common use.
- 1.6 In the event of any inconsistency of definitions in the matters detailed in paragraphs 1.2 to 1.5 above, the meanings shall prevail in the following order:
  - this Licence;
  - the Act;
  - the Regulations;
  - any other regulations made under the Act;
  - the SER;
  - the Application;
  - the dictionary.
- 1.7 If any General Conditions, Special Conditions, Advisory Notes or other provision of this Licence are found or determined to be invalid or unenforceable, this Licence remains enforceable and subject to any remaining provisions, General or Special Conditions



## **Schedule 2**

### **Site**

#### **2. Site**

- 2.1 The Site is the site proposed for the Replacement Research Reactor Facility as shown in Figure 2.1-4 of Appendix B to the Application; being an area of land generally bounded by Mendeleeff Avenue, Lucas Heights, Old Illawarra Road, Lucas Heights and the existing perimeter fence of the Lucas Heights Science and Technology Centre in the State of New South Wales.

## **Schedule 3**

### **Controlled Facility**

#### **3. Controlled Facility**

- 3.1 Controlled Facility means the Replacement Research Reactor Facility proposed and detailed by the Licensee in the Application.

## **Schedule 4**

### **General Conditions**

#### **4. General Conditions**

- 4.1 The Licensee must comply with the Act, the Regulations and any further regulations made or prescribed under the Act which apply or are applicable to this Licence or the Controlled Facility licensed hereunder.
- 4.2 The Licensee shall ensure that there is no change to the Nominee in respect of the person occupying the position of Nominee or in respect of duties or control, unless the CEO ARPANSA has approved such change.
- 4.3 The Licensee must ensure that no person acts or continues to act as the Nominee (other than the Nominee detailed in the Application) unless approved by the CEO ARPANSA in his absolute discretion.
- 4.4 The Licensee must comply with the undertakings, obligations, promises or details in its Application in respect of this Licence.
- 4.5 This Licence must be prominently displayed at the Principal Place of Business of the Licensee and must be drawn to the attention of all staff, employees, contractors, servants, agents or invitees of the Licensor or any partly or fully owned subsidiary company, organisation or body corporate.
- 4.6 The Licensee will advise the CEO ARPANSA in writing within seven days of any change in the Principal Place of Business of the Licensee.
- 4.7 The Licensee must remain a body corporate established under section 4 of the Australian Nuclear Science and Technology Organisation Act 1987 and must advise the CEO ARPANSA in writing within seven days of any change in ownership, constitution



or statutory organisation.

- 4.8 In preparing the Site under this Licence, the Licensee must have regard to the Australian Radiation Protection and Nuclear Safety Agency (April 1999), *Draft Safety Assessment Principles for Controlled Facilities*; Australian Radiation Protection and Nuclear Safety Agency, *Draft Criteria for the Siting of Controlled Facilities, April 1999*; and any other relevant principles or guidelines issued by the CEO ARPANSA from time to time.

## **Schedule 5** **Special Conditions**

### **5. Special Conditions**

- 5.1 The Licensee may only prepare the Site authorised under this Licence, and must not construct, possess, control, operate or decommission the Replacement Research Reactor Facility (unless licensed or properly authorised by the CEO ARPANSA under the Act) or otherwise engage in conduct which is prohibited under the Act, the Regulations or any further regulations made under the Act.
- 5.2 The site to be prepared by the Licensee under this Licence will only be used for the kind or category of controlled facility described in the Application.
- 5.3 The Licensee shall ensure that ANSTO and vendor/contractor quality assurance systems for preparing the Site are clearly specified and have recognised quality practices accreditation
- 5.4 The Licensee shall ensure that it complies with any quality assurance systems specified in Special Condition 5.3 of this Licence and that such compliance can be readily verified by audit.
- 5.5 The Licensee shall ensure that there are no changes to the boundaries or use of land within the Buffer Zone unless the CEO ARPANSA has approved such change in his absolute discretion.
- 5.6 The Licensee shall establish a radiological characterisation of the Site for the Replacement Research Reactor Facility and a radiological characterisation of the Buffer Zone to provide a fundamental basis for ongoing radiological monitoring programs and the detection of radiological trends over time.
- 5.7 The Licensee shall ensure that:
- (a) a review of the topography and food production farming within 15 km of the Site is performed to confirm the likely impact of radioactive discharges from the Replacement Reactor Facility, and submitted to the CEO ARPANSA as soon as is reasonably practicable;
  - (b) the population distribution estimates submitted with the Application are confirmed, and that any special needs groups within 5 km of the Site are identified, and submitted to the CEO ARPANSA as soon as is reasonably practicable;
  - (c) an investigation of ground water direction and flow rate at the Site under heavy precipitation conditions is performed, and the results submitted to the CEO ARPANSA as soon as is reasonably practicable;



- (d) the severity of local flooding at the Site is estimated having regard to the stormwater control plan recommended by Environment Australia in the Environment Assessment Report and be documented in the Preliminary Safety Analysis Report;
  - (e) the additional analysis of seismic hazards at the Site arising from the HIFAR Probabilistic Safety Assessment to describe uncertainties in the seismic characteristics of the Site and confirm the conservative upper bound value for use as a design basis for the Replacement Research Reactor Facility, is completed and submitted to the CEO ARPANSA as soon as is reasonable practicable together with documentation detailing the resolution of any issues raised by the analysis;
  - (f) design bases for seismic events are determined for the Experimental Guide Hall;
  - (g) seismic upgrading work to the LHSTC water tower as recommended in the Horoschun report in 1985 is completed as soon as is reasonably practicable;
  - (h) further assessment and analysis is completed as soon as is reasonably practicable to ensure that all possible exposure pathways for radiological doses to people and future events at the Cronulla Sewage Treatment Plant are taken into account in determining radiation doses arising from liquid discharges.
- 5.8 The Licensee shall confirm that the communication tower located near the Site will not be capable of transmitting radiation that could interfere with the electrical equipment of the Replacement Research Reactor Facility.
- 5.9 The Licensee shall ensure that the Preliminary Safety Analysis Report for the Replacement Research Reactor Facility includes provision for ongoing monitoring and audit of the frequency and severity of external events to ensure that assessed risks to the replacement reactor remain valid and acceptable, taking into account new developments in the vicinity of the reactor over time.
- 5.10 The Licensee shall ensure that the design bases for the Replacement Research Reactor Facility take account of:
- (a) interruptions to off-site and on-site water and off-site electrical power supplies due to seismic events;
  - (b) lightning strikes;
  - (c) ground water leakage into spent fuel stores;
  - (d) intense precipitation events;
  - (e) loss of off-site electrical supplies impacting on water supply and fire-fighting capability;
  - (f) interruptions to electrical supplies during parallel operation of the proposed reactor and HIFAR;
  - (g) sabotage events, and
  - (h) the impact of bushfires on the Replacement Research Reactor Facility, its essential services and emergency planning arrangements.
- 5.11 The Licensee shall report to the CEO ARPANSA within three months of the date of issue of this Licence, for agreement, on the program and schedule for arrangements to ensure compliance with the conditions of this Licence, and every three months thereafter on the progress for implementation.



**Schedule 6**  
**Advisory Notes**

The following advisory notes apply under this Licence.

**6. Advisory Notes**

- 6.1 When any further application under the Act for a Licence is made with respect to the Replacement Research Reactor Facility, the Licensee should annex and incorporate all documentation and supporting documentation referred to, or relied upon in support of the application for a Licence.
- 6.2 Any Application by the Licensee to CEO ARPANSA for a licence under the Act to construct the Replacement Research Reactor Facility should be accompanied by the Preliminary Safety Analysis Report.
- 6.3 Any Preliminary Safety Analysis Report submitted pursuant to Advisory Note 6.2 of this Licence should confirm that the Site and its characteristics do not adversely affect exposure pathways for radiological doses to people, and that any impacts on doses or changes to the site characteristics are monitored.
- 6.4 Any Preliminary Safety Analysis Report submitted pursuant to Advisory Note 6.2 of this Licence should also address the matters raised in Special Condition 5.10 of this Licence.
- 6.5 The Licensee should only apply for a facility licence under the Act to construct, have possession or control of, operate or decommission, dispose of or abandon the Replacement Research Reactor authorised to have a site prepared for it under this Licence if:
- (a) it is the Replacement Research Reactor Facility detailed in the Application and will be, or is, operated only for the following purposes:
    - (i) production of diagnostic and therapeutic radiopharmaceuticals;
    - (ii) maintenance of Australia's nuclear technical expertise;
    - (iii) provision of a neutron beam research facility;
    - (iv) provision of research, and research training, facilities and programs; and
    - (v) provision of industrial radioisotopes and facilities for neutron activation analysis, irradiation of materials, and neutron radiography;
  - and
  - (b) the Replacement Research Reactor:
    - (i) is a pool type research reactor, in which the core of the reactor is at the bottom of a pool of water at least eight metres deep;
    - (ii) has a maximum thermal power of 20 megawatts; and
    - (iii) uses low-enriched-uranium fuel.
- 6.6 In any application for a Licence under the Act to construct, operate, have possession or control of, or decommission, dispose of or abandon the Replacement Research Reactor Facility the Licensee should ensure that ANSTO and vendor/contractor quality assurance systems for the tendering, design, procurement, construction, commissioning, operation or decommissioning of the Replacement Research Reactor Facility are clearly specified and have recognised practices' accreditation for each of the stages relevant to



the application

- 6.7 In any application for a Licence under the Act to construct, operate, have possession or control of, or decommission, dispose of or abandon the Replacement Research Reactor Facility the Licensee should ensure that they comply with any quality assurance systems specified in Advisory Note 6.6 of this Licence and that such compliance can be readily verified by audit.
- 6.8 In any application for a Licence under the Act to construct the Replacement Research Reactor Facility, the Licensee should also ensure that:
- (a) the assumptions used in deriving the Reference Accident described in the licence application are accounted for in the final design of the proposed reactor, and that this is demonstrated in the Preliminary Safety Analysis Report for the reactor;
  - (b) the final design of the proposed reactor effectively excludes the failures of structures, systems and components to rule out fast loss of coolant as a credible accident, including for earthquakes of lower frequency than the design-basis earthquake, and that this is demonstrated in the Preliminary Safety Analysis Report for the reactor;
  - (c) prior agreement is sought from the Minister for the Environment and Heritage and the CEO ARPANSA to any major design changes such that the Reference Accident described in the licence application may no longer be valid.
  - (d) the safety implications of an inter-linked store for spent fuel elements and the need for a drencher system for the cooling tower are assessed in detail in the Preliminary Safety Analysis Report;
  - (e) the final design of the Replacement Research Reactor Facility includes a fire suppression system; and
  - (f) the Preliminary Safety Analysis Report is subject to independent peer review.

