



## **Comments to the CEO of ARPANSA Relating to the Decommissioning of HIFAR**

The Nuclear Safety Committee was briefed on the decommissioning of HIFAR at its meetings of June 2003 (item 7) and October 2003 (item 7.1). The following information was received during those briefings:

### **General Information**

HIFAR is expected to be shut-down in late 2006 and will operate through the commissioning of the Replacement Research Reactor. Consequently, there will be a short period of dual operation of the two reactors.

There is currently enough fuel available for HIFAR to operate at full power until late 2006. Operating beyond 2006 would require approval under the ARPANSA licence.

The decommissioning of HIFAR will permanently remove the reactor facility from service and reduce radioactive material to levels that would permit termination of some or all of the regulatory controls of the reactor. Decommissioning will be a staged process covering:

- the final shutdown;
- removal of fuel;
- decontamination of plant and equipment; and
- final release of the site for unrestricted use.

The process is expected to achieve a progressive and systematic reduction in radiological hazards and will be carried out on the basis of pre-planning and assessment to ensure safety during decommissioning operations.

The spent fuel will be removed shortly after HIFAR is shut down and both ARPANSA and ASNO will be advised when that happens. Some minimal decontamination work will probably be needed on the reactor. The actual shut-down process was expected to take three to four months to complete.

As heavy water is an expensive commodity, it is economic to re-use it, than dispose of it as radioactive waste.

Contractors are expected to be used to deal with non-radioactive waste, such as asbestos, and the disposal of such waste would be under the relevant legislation.

### **Preliminary Plan – Decommissioning Stages**

The preliminary plan forwarded to ARPANSA, and circulated to the NSC at its June 2003 meeting, highlighted four distinct stages in the decommissioning process, which were:

- Stage 1:** Removal of the fuel, fluids drained from the facility and external materials, such as the control room and cooling towers, disconnected or removed.
- Stage 2:** Monitoring and maintenance continued until the documentation and arrangements are in place for the third stage.

- Stage 3:** The decommissioning stage, which includes the removal of all radioactive and other wastes.
- Stage 4:** Unrestricted site use. The site would be permitted to return to a green fields site or to be used for other purposes without restrictions being imposed.

### **Preferred Decommissioning Option for HIFAR**

ANSTO preferred the 'safe enclosure' option as the best option for decommissioning HIFAR. After dismantling the externally accessible parts of the plant, the remaining reactor components and the associated plant and equipment would be stored in the D<sub>2</sub>O plant room for a period of 30 years. This option was preferred because:

1. HIFAR is situated in a licensed operating nuclear site and there is no pressing need for the immediate restoration of the HIFAR location to a green field site as there is no urgent need to reuse the land.
2. The extended period of surveillance, care and maintenance takes advantage of the decay of shorter-lived radioisotopes. Deferral of dismantling and demolition reduces the quantities of radioactive waste produced and radiation exposure to site personnel.
3. ANSTO may wish to make HIFAR available to public tours. HIFAR, being the first research reactor built in Australia, is of scientific and historical importance. HIFAR and the replacement pool-type reactor would provide an interesting contrast in design and technology.
4. The nominal 30-year period would fit in well with the experience of the Danes in planning for DR-3 decommissioning. The Danes had considered decommissioning scenarios with decay times of 10, 25, and 40 years for the assessment, and they concluded that there would not be much to gain by allowing for a much longer period; some operations will still need to be performed remotely.
5. The delay in dismantling could permit any future technological improvement to be incorporated into the process when decommissioning activities are resumed.

### **Staff Training**

Approximately 10 ANSTO staff will make up the decommissioning team and these staff have training and experience in the decommissioning process. A staff member from ANSTO had also been sent overseas to witness and gain experience in the decommissioning of a reactor.

A similar reactor to HIFAR located in Denmark is scheduled for decommissioning before HIFAR and the process will be followed by the appropriate ANSTO staff.

### **Documentation**

All design drawings for HIFAR are still available and many of the staff who have been involved with the operation of HIFAR will be able to provide their knowledge and information in the early stages of decommissioning.

It is a condition of the ARPANSA licence that records and reports be maintained and that all engineering drawings are available. The specifications of the concrete and steel used in the construction are still available and ARPANSA could conduct an audit of these items.

### **Computer Based Information**

Since the reactor was commissioned, computing hardware and software has changed significantly and a mock exercise using current technology might be needed. Most of the information, drawings etc on HIFAR pre-dated computers.