



AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY

**SECOND QUARTERLY REPORT
OF THE
CHIEF EXECUTIVE OFFICER**

FOR THE PERIOD 1 APRIL TO 30 JUNE 1999

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1. FOREWORD

The Australian Radiation Protection and Nuclear Safety Act requires the CEO each quarter to prepare and give to the Minister of Health and Aged Care a report on the operations during the quarter of the CEO, ARPANSA, the Council and committees. The Act requires that the report include:

- details of directions given by the Minister to the CEO during the quarter under section 16 of the Act;
- details of any breach of licence conditions by a licensee during the quarter, of which the CEO is aware;
- details of all reports received by the CEO during the quarter from the Council or the Nuclear Safety Committee; and
- a list of all facilities licensed under Part 5 of the Act during the quarter.

The Minister must arrange for the tabling of the quarterly report in each House of the Parliament within 15 sitting days of receipt of the report.

On 15 April 1999, the Governor General appointed Dr John Loy to be CEO of ARPANSA. The appointment is for a period of five years.

2. REPORT ON PERFORMANCE

(a) ISSUES ARISING DURING TRANSITION PERIOD

The ARPANS Act came into force on 5 February 1999 and the ARPANS Regulations on 17 March 1999. The ARPANS Act has a six months transition period (until 5 August 1999) during which time Commonwealth agencies have to apply for licences to enable them to deal with (i.e. possess, have control of, use, operate, or dispose of) radiation sources, facilities and nuclear installations.

Maralinga

Following the Pit 17 incident on 21 March 1999 reported on in the first quarterly report, treatment of pits using the in-situ vitrification (ISV) process has ceased pending

investigations by the operators of the cause of the incident and a risk assessment of the process. An independent risk assessment of the ISV process by the Australian Nuclear Science and Technology Organisation was commissioned by the Department of Industry Science and Resources (DISR).

Over the past few months debris from the ten remaining pits has been excavated and placed at the bottom of a trench 7 to 13 metres below the surface awaiting assessment of various treatment options. A risk assessment has been commissioned by DISR on the acceptability of burying contaminated debris at the bottom of this trench. This could be an alternative to the ISV process.

These assessments are currently being reviewed by ARPANSA.

Australian Nuclear Science and Technology Organisation (ANSTO)

Radiation Protection Incident

On 10 March 1999, ANSTO reported that an ANSTO staff member was exposed to radiation of the extremities in excess of the statutory limit, while preparing radioactive microspheres for use in a new medical procedure. The officer received 550 milliSievert (mSv) to his fingers, which is in excess of the international limit of 500 mSv as adopted by the NHMRC in 1995, and recently adopted in the new *ARPANS* legislation.

Initial investigations into this incident by staff of both ANSTO and ARPANSA reveal that similar incidents (with lower doses) had occurred previously. Inadequate follow-up and management procedures had failed to prevent a recurrence. Further investigations are continuing and will be reported in subsequent reports.

Fuel Handling Incident, February 1999

ANSTO notified ARPANSA that the INES¹ ratings of the spent fuel handling incident that occurred on 1 February 1999 (reported in the previous quarter) and an earlier incident on 13 August 1998, had been revised upward from a provisional rating of Level

¹ In 1992 the International Atomic Energy Agency (IAEA), in conjunction with the Nuclear Energy Agency (NEA) of the OECD, invited the formal adoption of the International Nuclear Event Scale (INES) for power reactors. Also, they invited the trial use of the Scale for other types of nuclear installations. In 1995 the period for the trial use of the Scale for other types of installations ended with the recommendation that INES be adopted for all civilian nuclear installations, including research reactors. The primary purpose of the INES is to facilitate communication between the nuclear community, the media and the public, in relation to such events. The INES runs from Level 0, for events of no safety significance, to Level 7 for major accidents, *e.g.* the Chernobyl accident.

0 to Level 1, i.e. anomaly beyond the authorised operating regime. ARPANSA agreed with the revised ratings.

A submission was received from ANSTO on 14 April 1999 detailing the proposed procedure for recovery from the February 1999 incident. This was reviewed and agreement to the operation provided on 15 April 1999 when the recovery operation was carried out successfully.

During the quarter, ANSTO provided reports by their Materials Division of visual observation of the retrieved canisters and fuel elements dropped in August 1998. The examination revealed some damage to the canisters but only slight mechanical damage of the fuel plates, and a small amount of pitting corrosion. However, the actual fuel material was not exposed and the damage will not effect safe handling, storage and transport of the elements.

A detailed report on the root causes of these fuel handling incidents, requested by ARPANSA, is being prepared by ANSTO. ARPANSA has been notified of, and will review, the measures being taken by ANSTO to prevent a recurrence of the incidents. These include revision of procedures, training of operators and upgrading of the flask used in spent fuel handling operations.

Damaged Sewerage Pipeline At Lucas Heights

ANSTO's routine discharges into the sewer are controlled in accordance with a Trade Waste Agreement with Sydney Water Corporation and the Agreement has been independently checked by ARPANSA. This ensures that the discharges contain only very low levels of radioactivity which are less than the World Health Organization's drinking water standards at the Cronulla sewerage works.

On 25 May 1999 a Sydney Water subcontractor cracked the ANSTO sewerage discharge pipeline resulting in leakage of water. Leakages were dammed and pumped into trucks for disposal. ANSTO took water and soil samples to confirm measurements were within limits set by the Trade Waste Agreement between ANSTO and Sydney Water. ARPANSA independently confirmed that the hazards to the public and sewerage workers were insignificant.

Little Forest Burial Ground

During the reporting period, the media carried stories on radioactive waste generated by ANSTO which was buried at the Little Forest Burial Ground near the main ANSTO site between 1960 and 1968. In total approximately 47,600 packages of active waste, with a volume of 1,675 cubic metres, were buried in 77 three metre deep trenches.

The site is routinely monitored by ANSTO and the results reported in its annual Environmental Survey Reports. There has been extensive sampling of vegetation, soil and water as well as airborne dusts. The Australian Radiation Laboratory monitored the site in December 1990 as part of a review of the site.

ANSTO will be applying for a licence to operate the site. ARPANSA will review the site further and consider any necessary conditions to apply to the licence at that time.

(b) DIRECTIONS BY THE MINISTER

The Minister gave no directions during the quarter.

(c) REGULATION

Licence Applications

Applications for licence with respect to the existing radiation activities of Commonwealth departments and agencies are required to be submitted to ARPANSA by 5 August 1999. During the quarter, officers of ARPANSA provided information on the requirements for licence applications to many Commonwealth departments and agencies. In particular, staff made several visits to ANSTO, the Department of Defence, the Commonwealth Science and Industrial Research Organisation and the Australian National University.

As of 30 June 1999, ARPANSA had received an application from ANSTO for a facility licence to prepare a site for the Replacement Research Reactor. Additionally, two applications for a source licence were also received from the Medical Radiation Branch and Scientific Services Branch of ARPANSA.

No licences had been issued by the end of the reporting period.

Replacement Reactor Siting Application

The Application contains: information describing the purpose of the replacement reactor facility; a description of the reactor facility and the site; the environmental assessment and its outcome; the siting safety assessments; a description of plans and arrangements of how ANSTO proposes to manage safety of the reactor facility. ARPANSA is reviewing all documents submitted by ANSTO against its Draft Safety Assessment Principles and Draft Siting Guideline and legislative requirements.

The following technical documents were submitted for ARPANSA review:

- The Draft, and Supplement to the Draft, Environmental Impact Statement (EIS) for the Replacement Nuclear Research Reactor;
- Environment Australia's evaluation of the Final EIS, and the Environment and Heritage Minister's recommendation on the environmental assessment;
- A submission describing the characteristics of the site, and the site related design basis, including the extent to which the site may be affected by natural or man-made events; and
- A siting safety assessment establishing the suitability of the site based on an hypothetical, severe reference accident.

As required by the *Australian Radiation Protection and Nuclear Safety Regulations 1999*, receipt of a site licence application for the research reactor was advertised, the documentation was made available to the public and public comment was invited. Seventy-three submissions were received from the public and are being assessed by ARPANSA.

Personnel

Recruitment action for a total of seven staff required to administer regulatory functions under the legislation, was undertaken during the quarter. This action will be well progressed before 5 August 1999, when the licensing requirements of the Act come into force.

Safety of ANSTO Nuclear Plant

The *Australian Nuclear Science and Technology Organisation Amendment Act 1992* established the Nuclear Safety Bureau (NSB) with functions which include the review of safety of ANSTO's nuclear plant. This part of the Act was repealed with the proclamation of the *ARPANS Act*. However, in the period prior to a decision being made on an application for licence for these facilities, the CEO of ARPANSA has functions and powers to enable the safety review formerly performed by the NSB to be continued by ARPANSA.

ARPANSA reviewed all the abnormal occurrences at ANSTO's nuclear plant reported during the quarter and it was concluded that none had adverse safety implications. ARPANSA continued to assign levels on the International Nuclear Event Scale to these abnormal occurrences, on a trial basis. All occurrences during the quarter were assigned Level 0, i.e. of no safety significance.

Radioactive airborne discharges from HIFAR were reviewed by ARPANSA for compliance with the airborne discharge authorisation issued by the NSB. Levels of

discharges for the first quarter of 1999 were less than the notification levels specified in the authorisation. ANSTO is yet to report on the discharge levels and calculated doses to the public arising from the discharges for the second quarter. Liquid discharges from the Lucas Heights Science and Technology Centre for the first quarter of 1999 were reviewed and found to be in compliance with the Trade Waste Agreement between Sydney Water and ANSTO.

As part of the ongoing review of safety at HIFAR, ARPANSA reviewed the progress of modifications to the reactor and conducted an audit of HIFAR maintenance. The audit was based on the safety guides and auditing techniques of the International Atomic Energy Agency. A draft of the audit report is currently with ANSTO for review and comment. APANSA representatives will meet with ANSTO personnel to discuss the findings before the report is finalised.

(d) COUNCIL AND COMMITTEE OPERATIONS

The Radiation Health and Safety Advisory Council is established under the ARPANS Act to advise the CEO on radiation protection and nuclear safety matters. It may identify and advise the CEO of emerging issues, examine matters of major concern to the community, and advise the CEO on the adoption of recommendations, policies, codes of practice and standards and on any other matters identified by the CEO or the Council.

Council members are to be appointed by the Minister for Health and Aged Care, in accordance with the ARPANS Act, and this process is expected to be completed in the July - September quarter.

The Act also establishes two supporting committees, the Radiation Health Committee and the Nuclear Safety Committee. As the Act requires that the CEO consult with the Council before appointing members of the Radiation Health Committee or Nuclear Safety Committee, these committees are yet to be appointed.

Therefore at 30 June 1999, the CEO has received no reports from Council.

(e) INTERNATIONAL LIAISON

CEO's Overseas Visit

Dr Loy visited the United States, Canada, the UK, Sweden and Austria in April. The purpose of the visit was to meet and discuss issues of interest with radiation protection and nuclear safety agencies in the US, Canada and Europe, to attend meetings at the International Atomic Energy Agency and to meet senior staff of the Agency. In Canada, Dr Loy also represented Australia at an international meeting on ionizing radiation and the environment.

International Atomic Energy Agency (IAEA)

ARPANSA contributes to the IAEA/Regional Cooperative Agreement program, through which the IAEA provides assistance to its Member States in the Asian Region. In June 1999, ARPANSA hosted a one week workshop for 17 Asian participants on occupational radiation protection.

During the reporting period, ARPANSA also provided occupational training in radiation protection to two scientific officers from the Philippines and provided guidance on regulatory issues to a legal officer from Syria. These placements at ARPANSA were undertaken as IAEA sponsored fellowships.

A Regulatory Branch officer attended the annual meeting of the IAEA Transport Safety Standards Advisory Committee (TRANSSAC) in Vienna, 26 - 30 April 1999, as the Australian Member. The main topics discussed were plans for Safe Transport Safety Standards Series publications, the Transport Regulations revision process and transport safety information services and training.

The Director, Standards, Policy and Corporate Support Branch, who has been appointed Chair of the IAEA's Radiation Safety Standards Advisory Committee (RASSAC) for its next three-year term, attended a RASSAC meeting in Vienna, 18 - 21 May 1999, and a subsequent meeting of the IAEA's Advisory Commission on Safety Standards. These meetings reviewed a number of documents under preparation for the IAEA's Safety Standards Series and discussed related matters.

From 21 to 25 June 1999, an officer attended a meeting in Vienna of the IAEA Radioactive Waste Safety Standards Advisory Committee (WASSAC) to review progress in the development of the Agency's waste safety standards and to provide advice on radioactive waste management issues.

Comprehensive Test Ban Treaty Organisation (CTBTO)

An ARPANSA officer attended a working group of the CTBTO from 10 – 21 May 1999 in Vienna.

United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)

An ARPANSA officer represented Australia at the 48th session of UNSCEAR in Vienna from 12 – 17 May 1999.

European Commission

An ARPANSA officer visited Malmö, Sweden to attend two scientific programs sponsored by the European Commission. The first program, from 8-12 June, was the European Radiation Protection, Education and Training course on the Physics of Medical Imaging. The second program, from 13-15 June was for the Workshop on Medical X-ray Imaging.

Consultative Committee on Ionizing Radiation

A meeting at the International Bureau of Weights and Measures, 26 – 28 May, 1999 in Paris, was attended by an ARPANSA officer. The meeting discussed the implementation of the agreement for the mutual recognition of national measurement standards and of calibration and measurement certificates issued by national metrology institutes due to be signed on 14 October 1999. The National Physical Laboratory (NPL) in the UK was also visited to resolve issues relating to an intercomparison of standards of absorbed dose between NPL and ARPANSA.

Nuclear Safety Convention

ARPANSA carries the primary responsibilities for Australia's obligations under the International Convention on Nuclear Safety that applies to land-based civil nuclear power stations and entered into force in October 1966. All countries with operational nuclear power stations, other than India, Kazakstan and Taiwan, belong to the convention. Every three years the effectiveness of the regulatory framework of signatory states and the safety of their nuclear power plant must be assessed against articles of the convention by a peer review process, providing transparency to other member countries.

During April, ARPANSA officers led the Australian delegation to the first peer review meeting of 45 countries, held in Vienna. The meeting was generally considered to have been successful with frank and open discussion by technical experts identifying good practices, problems and making recommendations for improvements in the nuclear programs of the member countries.

Korean Peninsula Energy Development Organisation (KEDO)

In 1995 the Governments of the United States, Japan and the Republic of Korea (ROK) established KEDO to finance and supply two large nuclear power plants of standard ROK design to North Korea (DPRK) for electricity generation. The Australian Government joined the organisation in 1995. In April an ARPANSA officer attended a meeting in South Korea of the Nuclear Safety Advisory Group, a standing body of senior experts providing advice to KEDO on nuclear safety and regulation of the project.

Forum on Nuclear Cooperation in Asia

A workshop in Malaysia to promote safety culture in the nuclear industry in Asia, sponsored by ANSTO, was attended by an ARPANSA officer.

Northwest Institute of Nuclear Technology (NINT), China

In June, 1999 two engineers from NINT in the Peoples' Republic of China commenced four months of training in nuclear test site remediation techniques developed by ARPANSA primarily for the Maralinga clean-up project. This training is part of a contractual arrangement which includes the provision of specialised vehicles fitted with radiation detection equipment.

Radon Remediation

An ARPANSA officer participated in an international workshop on radon remediation in Athens, Greece from 17 – 25 April 1999.

(f) UNIFORMITY OF RADIATION PROTECTION FRAMEWORKS

At their meeting in Darwin on 22 April 1999, the Australian Health Ministers Advisory Council (AHMAC) accepted a proposal from ARPANSA for the development of a National Directory for Radiation Protection. It was proposed that the National Directory provide an overall agreed framework for radiation safety, including both ionizing and non-ionizing radiation, together with clear regulatory statements that are able to be adopted within existing Commonwealth and State/Territory legislative frameworks. Proposed timelines for development of the National Directory and a process to be followed in developing the provisions were also accepted by AHMAC.

AHMAC also accepted the recommendation that, once developed, the provisions of the Directory should be implemented by all jurisdictions within existing legislation as soon as possible and with a minimum of further changes. The proposals will now be considered by the Australian Health Ministers' Conference at Ministers' meeting on 4 August 1999.

(g) OTHER HIGHLIGHTS

National Competition Principles Review

Terms of Reference for a National Competition Policy Review of Radiation Control Frameworks (the NCP review) were agreed by States and Territories at officer level following advice from the Office of Regulation Review (Commonwealth) and the Secretariat to the Council of Australian Governments' Committee on Regulatory Reform.

The NCP review will be overseen by the National Uniformity Implementation Panel (Radiation Control), which is chaired by the Commonwealth and comprises radiation health representatives of all States and Territories. Queensland has indicated that it will not participate in the NCP review. As a consequence, some further discussions are required to finalise the cost sharing arrangements for the review.

It is anticipated that, following further consideration by States and Territories during August, the Terms of Reference for the NCP review will be put before Health Ministers (out-of-session) during September 1999. Contractors will be selected to undertake the review during October, and it is proposed that the final report of the review will be made to Ministers in June 2000.

Comprehensive Test Ban Treaty Organization (CTBTO)

During June, ARPANSA signed a contract with the CTBTO for the installation of two radionuclide particulate monitoring stations at locations in Perth and Melbourne. To be operated and maintained by ARPANSA, these stations are part of an international network being established by the CTBTO to monitor compliance with the provisions of the treaty. Installation is expected to be complete by December 1999. The CTBTO has also asked ARPANSA to undertake site surveys for additional monitoring stations in Darwin and Townsville.

Nuclear Powered Warship Reference Accident

ARPANSA has drafted a report proposing use of a revised reference accident for assessing the suitability of Australian ports for visits by nuclear powered warships. This work is being performed for the Visiting Ships Panel (Nuclear) (VSPN, an interdepartmental committee which has the responsibility of coordinating visits to Australia). The revision considers relevant advances in accident modelling, new information on nuclear accidents and discussions held with representatives of State and Territory and overseas agencies. The final draft has been reviewed within ARPANSA,

and the CEO is to meet with the Chairman of the VSPN to discuss arrangements for publishing the report.

John Loy
CEO
13 August 1999