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AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY

QUARTERLY REPORT  
OF THE  
CHIEF EXECUTIVE OFFICER  
OF ARPANSA

FOR THE PERIOD 1 APRIL TO 30 JUNE 2001





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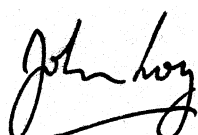
15 August 2001

Senator the Hon Grant Tambling  
Parliamentary Secretary to the Minister for Health and Aged Care  
Parliament House  
CANBERRA ACT 2600

Dear Senator Tambling

In accordance with the *Australian Radiation Protection and Nuclear Safety (ARPANS) Act 1998*, I present to you my Quarterly Report for the period 1 April to 30 June 2001.

Yours sincerely



Dr John Loy  
CEO of ARPANSA



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## **FOREWORD**

The *Australian Radiation Protection and Nuclear Safety Act (1998)* requires the CEO each quarter to prepare and give to the Minister a report on the operations during the quarter of the CEO, ARPANSA, the Council and Committees. Section 16 of the Act requires that the report include details of directions given by the Minister to the CEO during the quarter; any breach of licence conditions by a licensee during the quarter, of which the CEO is aware; all reports received by the CEO during the quarter from the Council and Committees; and facilities licensed under Part 5 of the Act during the quarter.

Further details about matters contained in this report are available through the ARPANSA Information Officer who can be contacted by telephone on 03 9433 2211, by facsimile on 03 9432 1835 or by e-mail to [arpansa@health.gov.au](mailto:arpansa@health.gov.au).

## **REPORT ON PERFORMANCE**

### **(a) UNIFORMITY OF RADIATION PROTECTION FRAMEWORKS**

#### National Competition Policy Review of Radiation Protection Legislation

The outcomes of the focussed consultation on this review were discussed with the Steering Committee on 27 April, and the report was then finalised. The final report for the review was forwarded to the Australian Health Minister's Advisory Council (AHMAC) in early May with the recommendation that ARPANSA co-ordinate a national response to the recommendations for presentation to the Australian Health Minister's Council (AHMC). The report received AHMAC endorsement at its meeting of 31 May. The final report will now be forwarded to the August AHMC meeting.

### **(b) ADVICE ON RADIATION PROTECTION AND NUCLEAR SAFETY**

#### Designated National Authority for Radiation Emergencies

In December 2000, the International Atomic Energy Agency (IAEA) upgraded arrangements for meeting its obligations under the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. These arrangements include the designation of Contact Points for radiation emergencies in each of the Member Countries.

In June this year, the Department of Foreign Affairs and Trade designated ARPANSA as two of these contact points: the National Competent Authority for Domestic Radiation Emergencies (NCA (D)) and the National Competent Authority for Radiation Emergencies Abroad (NCA(A)). The same month, Daniel Westall attended the first meeting of Competent Authorities identified under the Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency. The meeting was held in Vienna, and considered the revised arrangements for notification of emergencies and requests for assistance established by the IAEA.

The Health Physics Section of the Environmental and Radiation Health Branch is responsible for the coordination and operation of the NCA(D) and NCA(A) within ARPANSA. The Branch has established a Radiation Emergency Coordination Centre at its Yallambie office with 24-hour fax and telephone facilities to provide communications with the IAEA in the event of a significant radiation accident within Australia or abroad. ARPANSA is also a World Health Organisation (WHO) Collaborating Centre for Radiation Protection and Radiation Emergency Medical Assistance, and a member of the WHO Radiation Emergency Medical Preparedness and Assistance Network.

#### Port Validations for Nuclear Powered Warships

ARPANSA officers visited the port of Hobart on 2-4 May as part of the Visiting Ships Panel (Nuclear) program of re-validation of ports for visits of nuclear powered warships. The port was re-validated.

#### Conferences, Meetings and Technical Advice

- Wayne Cornelius attended a Brisbane meeting of the National Health and Medical Research Council Electromagnetic Emission (EME) Research Expert Committee on 28 June and gave presentations on the development of the ARPANSA radiofrequency exposure standard to the EME Reference Group at ARPANSA's Miranda Office on 15 May.
- Michael Bangay attended meetings dealing with mobile phone towers with council officers at Sutherland Shire (NSW) and Kalumundra Shire (WA). He also presented papers at the Working Together Conference in South Australia in May, and the Mobile Networks and the Environment Conference in London on 26 June.
- Peter Gies of the Ultraviolet Radiation (UVR) Section participated in the first meeting of the Australian Cancer Society National Skin Cancer Steering Committee on UVA and Sunscreens on 10 May.
- Peter Gies also attended the Standards Australia Committee meeting on Solaria (27-29 June) and provided UVR expertise to help in the production of a new standard on Solaria.
- The Non-Ionizing Radiation (NIR) Branch also provided expert input on a joint Australian Communications Authority/ARPANSA poster on Mobile Phone Base Stations that was released on 14 June.
- John Baldas and Zlata Ivanov attended the thirty-first Annual Scientific Conference of the Australian and New Zealand Society of Nuclear Medicine in Hobart on 18-22 May. They presented a poster illustrating the ARPANSA quality assurance program for radiopharmaceuticals.
- David Webb was a delegate to the Consultative Committee on Ionizing Radiation, Section I, meeting at the International Bureau of Weights and Measures in Paris on 23-25 May. Delegates attended from fourteen countries and observers included people from the International Atomic Energy Agency (IAEA). There were presentations on laboratory

reports, and key comparison data was submitted for exposure and absorbed dose as reference material to the Mutual Recognition Arrangement database.

- David Webb participated in the Annual Meeting of the American Health Physics Society in Cleveland, Ohio. The trade area of the meeting was particularly useful for contact with manufacturers of equipment used by ARPANSA for dose standards maintenance, and for discussion with service providers requiring traceability to Australian measurement standards.
- The Medical Physics Section hosted a meeting of the Victorian Branch of the Australian Institute of Radiography at Yallambie on 27 June.

#### Public Communication Activities

- The UVR Section provided a display on Ultraviolet Protection Factor (UPF) Fabric testing and UVR hazard assessment at the Australian Science Festival Exhibition in Canberra on 2-5 May.
- The ARPANSA (Yallambie Campus) Open Day on 29 April involved guided tours, on site displays, measurements and advice for the general public. Around 240 people of all ages went on the tours. Topics included the measurement of UV radiation protection provided by clothing, the measurement of environmental radiofrequency electro-magnetic emissions, ionizing radiation standards and the calibration of dosimeters, the linear accelerator, and disaster planning and emergency preparedness. Some visitors indicated they were local residents and were pleased to meet staff and witness for themselves some of the work carried-out by the agency.
- On the evening of 14 June at the Engadine Senior Citizens Centre in Sydney, ARPANSA held the third in its series of public information sessions. Quite well attended, the session focused on the replacement reactor construction licence application and Preliminary Safety Analysis Report (PSAR) received from ANSTO in late May. Senior staff from the Policy and Communications Section, and Regulatory Branch, covered opportunities to make public submissions and where to access hardcopies of the application and PSAR; the detailed review being conducted by ARPANSA and experts assembled through the International Atomic Energy Agency; and the PSAR itself. There was a general question and answer segment with the CEO in the closing stages.
- The ARPANSA Information Officer continued to respond to a steady flow of public phone inquiries during the quarter. Most commonly, callers requested information about electricity and health or wished to hire magnetic field meters (available for a nominal fee). This was prompted by the release in March of the United Kingdom's NRPB Advisory Group on Non-ionising Radiation Protection report of an association of childhood leukemia with exposure to extremely low frequency fields (ELF) magnetic fields. Other frequently raised topics were the possible effects of mobile phones and base stations, the Australian strontium 90 testing program during the Cold War, x-ray shielding in clinics and the safe disposal of smoke alarms.

**(c) RESEARCH ON RADIATION PROTECTION, NUCLEAR SAFETY AND MEDICAL EXPOSURES TO RADIATION**

- Solar UVR data measured by ARPANSA in collaboration with the Antarctic Division for the Casey and Davis Antarctic Stations was provided to the Australian Antarctic Data Centre (AADC). Work has also continued on a follow-up paper that compares ARPANSA ground based solar UVR measurements with satellite data for the period 1992 to 2000.
- NIR Branch staff submitted the following publications:
  1. Health Promotion Journal of Australia, Brief Report: Meteorology meets public health – a novel collaboration. Helen Dixon, Lilia Lemus-Deschamps and Peter Gies.
  2. Archives of Dermatology: Time spent outside and the levels of UVR received by young children and their mothers. David O’Riordan, Warren Stanton, John Lowe, Peter Gies.

**(d) SERVICES PROVIDED IN RADIATION PROTECTION, NUCLEAR SAFETY AND MEDICAL EXPOSURES TO RADIATION**

UPF Fabric Testing and Labelling

Fabric UPF testing, licensing and labelling increased significantly since the previous quarter (which recorded a slight increase). 383 fabric samples were tested, twenty-five UPF trademark licences were granted and 755,000 UPF labels were issued.

EMR and Optical Radiation

There was a continuing strong demand for commercial service work including the laboratory calibration of radiofrequency monitors and probes. Seventy-two jobs were completed. This included sixty-two monitors, seventy-eight probes, nine personal dosimeters and four other sensors.

**(e) COUNCIL AND COMMITTEE OPERATIONS**

Radiation Health and Safety Advisory Council

The Council met on 9 April at ARPANSA’s Miranda office. A summary of the meeting is at [http://www.health.gov.au/arpansa/rhsac\\_m2.htm](http://www.health.gov.au/arpansa/rhsac_m2.htm)

Radiation Health Committee

The Radiation Health Committee did not meet during this quarter. The next meeting of the Radiation Health Committee is scheduled for 18-19 July.

## Nuclear Safety Committee

The Nuclear Safety Committee did not meet during the quarter. The next meeting of the Nuclear Safety Committee is scheduled for 5-6 July.

## Radiofrequency (RF) Exposure Standard Working Group

The draft RF Standard was released for public comment from 2 March to 11 May. Extended time was allowed to a number of organisations to forward submissions up until the start of June. Sixty-seven submissions were received. The submissions are being analysed in preparation for the working group meeting scheduled for 10-11 July.

## **(f) REGULATION**

### **Standards**

#### Standard Licence Conditions

An improved set of standard licence conditions for conducts at facilities and dealings with sources were developed and issued as Licence Conditions Handbooks for ANSTO, CSIRO, and the Department of Defence. The improvements include restructuring by consolidating and simplifying similar conditions, grouping conditions under topic headings, and removing time-related requirements which now are subject to the Licence Holder providing a plan and schedule to the satisfaction of the CEO. With licenses issued for several of ANSTO's nuclear installations, standard conditions for operating and for decommissioning a controlled facility were also introduced into the ANSTO Handbook.

#### Regulatory Assessment Guidelines

In response to invited public submissions, work is proceeding on changes to the following documents:

- Regulatory Assessment Principles for Controlled Facilities, and
- Regulatory Assessment Criteria for the Design of New Controlled Facilities and Modifications to Existing Facilities.

### **Licensing**

#### Application Assessment

The number of licence applications increased slightly from the previous quarter, with six facility and ten source licence applications being received by ARPANSA.

Four facility licences for nuclear installations were issued. These were for the decommissioning of ANSTO's Moata research reactor, the operation of ANSTO's HIFAR research reactor, ANSTO's fuel operations and ANSTO's Radiopharmaceuticals Operations. The CEO decided to grant the HIFAR operating licence after considering a Safety Evaluation

Report prepared by the Regulatory Branch of ARPANSA, and taking into account submissions sent by members of the public and Sutherland Shire Council. The CEO also issued a Statement of Reasons for his decision. Copies of this, and the other documents named, are available through [http://www.arpansa.gov.au/reg\\_home.htm](http://www.arpansa.gov.au/reg_home.htm).

Two facility licenses for prescribed radiation facilities were issued. One was for ANSTO's Gamma Technology Research Irradiator and the other was for the National Medical Cyclotron. One existing facility licence, from the Department of Industry, Science and Resources, was amended.

Of the six source licenses issued, four were for the CSIRO, one was for the ANSTO Environment Division and one was for the Australian Defence Force/Department of Defence. Two source license applicants were found to not require licensing by ARPANSA and one existing source licence, from the ANSTO Environment Division, was amended.

#### Import Permits

Eighty-eight import release permits were processed during the quarter, an increase of twelve over the March quarter. General requirements for Applications for Permits were posted on ARPANSA's web site.

### Australian Nuclear Science and Technology Organisation (ANSTO)

#### Replacement Research Reactor

On 21 May, ANSTO lodged an application for a licence to construct the replacement research reactor at Lucas Heights Science and Technology Centre. The application was based upon a detailed Preliminary Safety Analysis Report (PSAR). The CEO of ARPANSA advertised receipt of the application and invited submissions from the public about it. Full copies of the application and accompanying documentation were provided to State and Territory libraries, to four public libraries in Sydney's south, to Sutherland Shire Council and to other interested organisations. Comprehensive summaries were made available to the public on the Internet, in hard copy and on CD-ROM. This first round of public submissions should be sent to ARPANSA by 5 September. A second round of public submissions will be invited during the third quarter of the year.

ARPANSA coordinated an international team of six nuclear safety experts assembled through the International Atomic Energy Agency to critically review the PSAR for the replacement research reactor. This peer review arose from a recommendation of the Environment Minister in relation to the Environmental Impact Statement for the proposed reactor - that the PSAR must be subject to independent peer review to the satisfaction of ARPANSA. The peer review report is to be presented to ARPANSA by the end of July and will be made available to inform the public submission process.

It is anticipated that ARPANSA's detailed review of the application will take about nine months, with questions from an initial review seeking clarification and additional information to be forwarded to ANSTO shortly. The CEO has also requested the Nuclear Safety Committee to prepare advice for him on key safety issues arising from the replacement reactor project.

During the quarter, the CEO of ARPANSA prepared a proposal for a Public Forum on the safety of the proposed replacement reactor. The model put forward by ARPANSA allowed

forum participants to present matters raised in their first-round submissions, and to receive replies from the licence applicant, ANSTO, in an open and neutral setting. The proposal was circulated to Greenpeace, Friends of the Earth, the Australian Conservation Foundation, Sutherland Shire Council and other interested parties to determine if they wished to participate.

### ANSTO Airborne Discharge Authorisation

The ANSTO airborne discharge authorisation for the Lucas Heights Science and Technology Centre and Camperdown NMC sites was issued to ANSTO in June with their revised Licence Conditions Handbook and licences for their nuclear installations. This Discharge Authorisation expands on the previous one for HIFAR to include requirements and notification levels for all sources of radioactive airborne releases from ANSTO sites. The notification levels are amounts of radioactive materials that correspond to the agreed objective of 20 microsieverts per year for a member of the public, above which ANSTO would have to demonstrate that the doses to the public are as low as reasonably achievable.

The discharge authorisation will be released in the next quarter for public comment. The Authorisation remains in effect until the end of 2001 and may be modified following ARPANSA's review of public submissions received.

### Surveillance

#### Criticality

Comments have been received from ANSTO on a draft report of the review of their criticality safety by Regulatory Branch. These are being reviewed before finalising and issuing the report.

#### HIFAR Log Audit

An audit of the HIFAR operating log was conducted during this quarter. ARPANSA will follow up two areas to gain a better understanding of some HIFAR operational methods.

#### ANSTO Replacement Research Reactor Site Licence

The sixth report by ANSTO on their compliance with the Replacement Research Reactor Facility Licence, Site Authorisation, was received on 2 May. Compliance with conditions 5.6 Site Radiological Characterisation, 5.7 Effects of the Site on the Design, 5.9 External Events, and 5.10 Design Bases may be fully demonstrated in the Preliminary Safety Analysis Report received on 21 May, which is currently under assessment by ARPANSA. Regulatory Branch has assessed compliance with the other licence conditions as satisfactory.

## ANSTO Source Licences

An official inspection visit was convened at ANSTO Environment Division. This was to investigate technical breaches with regard to unlicensed sources, lost sources and compliance with special licence conditions.

## Facilities

ARPANSA investigated an incident at the isotope handling bay within the Radiopharmaceuticals Division of ANSTO. This incident involved the accidental dropping of an iridium 192 source, which was later recovered and stored safely. Reports on the incident are being reviewed by ARPANSA and a full account will be included in the next quarterly report.

## Australian Antarctic Division

The Australian Antarctic Division notified ARPANSA of a leakage of low-level radioactive waste in material returned from Antarctica. The leak was fully contained within the serial packaging and was only discovered when the returned drums were opened for separation, treatment and disposal of the contents. ARPANSA agrees that the repackaging of all the material into concrete-filled drums is the best solution and in this form it is acceptable for landfill disposal.

## Department of Industry, Science and Resources (DISR)

DISR complied with the majority of special licence conditions relating to the Maralinga rehabilitation project. DISR applied for, and was granted, an extension of time for two licence conditions. These conditions relate to the final publication of the AEA Technology Report that modelled various intrusion scenarios used in assessing the effectiveness of the disposal structures, and the development of a program of groundwater monitoring required to demonstrate that the environment has been adequately protected.

## **Safety of Australian Nuclear Science and Technology Organisation (ANSTO) Nuclear Plant**

### HIFAR Abnormal Occurrences

The Regulatory Branch is notified of all Abnormal Occurrences at HIFAR. For the period 1 April to 30 June there were two Abnormal Occurrences relating to Safety Rod No 2 exceeding a specified limit for drop time. ARPANSA classified these as Level 1 on the International Nuclear Event Scale (INES), i.e. an anomaly beyond the authorised operating regime, on the grounds that the occurrences had implications for safety culture. In the first occurrence, planned corrective actions following similar events six and nine months previously had not been carried out. Following the second occurrence, the operating staff did not properly investigate the cause of the problem before restarting the reactor and operating at full power.

There has been a history of the drop times of Safety Rod No 2 exceeding the limit and a number of investigations and corrective actions carried out to remedy the problem, without permanent success. However, following an occurrence that was classified as INES Level 0, the No 2 gearbox was replaced. This immediately resulted in measured drop times well within the limit. ARPANSA considers this and the other follow-up actions of bench testing the suspect gearbox to establish the nature of the fault, a program of preventative maintenance of the safety rod gearboxes, and installation of a new drop timer to be satisfactory.

#### Fuel Operations Abnormal Occurrences

As reported in the March quarter, Regulatory Branch was notified of two abnormal occurrences at a Fuel Operations facility. These occurrences involved the inadvertent lowering of the water level in a pond where waste items, resulting from the cropping of spent fuel elements, are stored. The lowered water level caused a radiation monitor to alarm when the dose rate increased above normal. ANSTO has informed ARPANSA of proposed corrective actions to prevent a recurrence and the schedule for implementation. These are currently being reviewed.

#### Radioactive Discharges

The reported radioactive airborne discharges from HIFAR and the Lucas Heights Science and Technology Centre site were reviewed by ARPANSA and found to comply with the airborne discharge authorisation issued by ARPANSA. All discharges were less than the notification levels specified in the authorisation corresponding to the agreed annual objective of twenty microsieverts.

ANSTO reported liquid discharges from the Lucas Heights Science and Technology Centre for April. These were reviewed by ARPANSA and found to comply with the Trade Waste Agreement between Sydney Water and ANSTO. This agreement limits concentrations of radioactive materials at the ANSTO discharge point to ensure compliance with the World Health Organisation Guidelines for Drinking Water Quality (1993) at the Cronulla Sewage Treatment Plant. ARPANSA is satisfied that adequate radiation protection is provided for sewerage workers and the public.

### **(g) INTERNATIONAL LIAISON**

#### United Nations Scientific Committee on the Effects of Atomic Radiation

Peter Burns attended the Fiftieth Session of the United Nations Scientific Committee on the Effects of Atomic Radiation in Vienna on 23-26 April. The meeting approved a report on the genetic effects of radiation (delayed from last year) and agreed to an approach and timetable for the next full report of the Committee.

## Comprehensive Test Ban Treaty

Peter Burns attended a meeting of Working Group B (Verification) of the Preparatory Commission for the Comprehensive Nuclear Test Ban Treaty in Vienna on 11-22 June. It was reported that twelve international monitoring stations in the network of 321 have been certified to date and that by the end of 2002 this number will grow to 87. The Pacific-rim satellite hub will be moved to Sydney to improve coverage in the Pacific region.

## Nuclear Energy Agency (NEA)

Kim Goodrick attended the third meeting in Paris of the NEA Expert Group on the evolution of a system of radiation protection. The Group is exploring the possible regulatory implications of changes to radiation protection doctrine currently being discussed.

John Loy  
CEO  
15 August 2001