



AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY

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

FOR THE PERIOD 1 OCTOBER TO 31 DECEMBER 2000



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Produced by the
Australian Radiation Protection and Nuclear Safety Agency
Lower Plenty Road
Yallambie VIC 3085
and
PO Box 655
Miranda NSW 1490

ABN 61 321 195 155

Telephone +61 3 9433 2211 and +61 2 9545 8333
Facsimile +61 3 9432 1835 and +61 2 9545 8314

E-mail arpana@health.gov.au
Internet Home page <http://www.arpana.gov.au>.

Information on the content of this report may be directed to the Information Officer.

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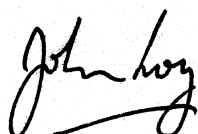
9 February 2001

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 October to 31 December 2000.

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. 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; 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 at arpansa@health.gov.au.

REPORT ON PERFORMANCE

(a) UNIFORMITY OF RADIATION PROTECTION FRAMEWORKS

National Directory for Radiation Protection

The Radiation Health Committee (RHC) reviewed an early draft of the National Directory at its November 2000 meeting. It was agreed that the structure of the document required further work and that this would take place before the next RHC meeting. Regulators would then consult on the Directory within their jurisdictions, with the aim of voting on the adoption of this first version of the Directory at a subsequent meeting.

National Competition Policy Review of Radiation Protection Legislation

The Issues Paper for the Review was distributed for public comment from 16 October until 15 December. Thirty submissions were received from interested organisations and individuals. The submissions are being considered and work on a draft final report has commenced. The draft report will be referred to the National Uniformity Implementation Panel (Radiation Control), the steering committee for this review, in late January 2001. During February 2001, a further round of focussed consultation will take place before the report is finalised.

(b) ADVICE ON RADIATION PROTECTION AND NUCLEAR SAFETY

- The Technical Report, *Results of the Quality Assurance Testing Program for Radiopharmaceuticals 1998 and 1999* was published and distributed to radiopharmaceutical manufacturers, nuclear medicine departments, regulatory authorities and libraries.

- Advice was provided to the Independent Steering Committee on the Emission of Radionuclides from the BHP Sinter Plant (Wollongong) on natural radioactivity and health risks of lead-210.
- Dr Stephen Solomon presented a series of lectures on radiation emergency response and post accident recovery at the Biennial Nuclear Powered Warship (NPW) Seminar held at Mount Macedon during November.
- A lecture on the medical management of radiation accident victims for the Victorian Health Service course on responding to chemical, biological and radiological incidents was delivered to hospital emergency department staff at Traralgon, Ballarat, Bendigo, Geelong, Monash and Melbourne.
- ARPANSA participated in the validation of the Port of Darwin Safety Plan covering emergency arrangements for visits by Nuclear Powered Warships. ARPANSA maintained an on-call radiation emergency response team and carried out the analysis of environmental samples during the visit to Brisbane by a Nuclear Powered Warship.
- Dr Peter Gies gave several interviews for ABC radio on ozone depletion and solar UVR levels and participated in the Standards Australia Committee on Solaria CS53, held in Sydney in November.
- A draft ARPANSA Radiation Protection Standard on Occupational Exposure to Ultraviolet Radiation was finalised. It will be released for public comment in early 2001.
- The Prevent Blindness Foundation prepared a brochure which reproduced (with permission) information from the ARPANSA information bulletin on sunglasses and protection from solar UVR.
- The new ARPANSA radiofrequency (RF) exposure Standard was progressed. Draft limits were thoroughly analysed to ensure a rigorous approach to safety and technical consistency in specifications. A thorough examination of relevant temporal and spatial averaging measurement parameters was undertaken.
- Dr Wayne Cornelius attended a Telecommunications Forum conducted by the Municipal Association of Victoria to talk on the development of the new ARPANSA radiofrequency (RF) exposure Standard. Data from the ARPANSA environmental RF survey specifically dealing with exposure levels associated with GSM base stations was presented.
- Dr Geoff Williams participated in the National Repository Advisory Committee (NRAC), which has provided advice to the Department of Industry, Science and Resources on selection of a site for the National Radioactive Waste Repository.
- The guidance manual *Medical Management of Individuals involved in Radiation Accidents* was revised and distributed to emergency medical Departments Australia-wide.

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

- Dr Peter Gies presented a paper *Personal Protection against Solar UVR* (Gies, Roy, Javorniczky & McLennan) at the Prevention of Melanoma and Skin Cancer Conference held at the Queensland Institute of Medical Research, in Brisbane on the 4 to 5 December 2000
- Dr Peter Gies presents a paper *Solar Ultraviolet Radiation and Methods of Protection* (Gies, Roy, Javorniczky & McLennan) at the "UnderCover" Shade Seminar, in Adelaide on 6 December 2000 which was organised by the Anti Cancer Foundation of South Australia and Parks and Leisure Australia.
- The Proceedings of the Internal Workshop on radon in the Living Environment, held in Athens in April 1999, were published by the European Commission and the National Technical University of Athens. It contains two contributions by ARPANSA scientists.
- Measurements were made of airborne radioactivity in the exploratory shaft of the proposed Jabiluka uranium mine in the Northern Territory. The purpose of these measurements was to evaluate a range of airborne radioactivity sampling methods, to assist in the development of guidance material for the revision of the Code of Practice on Radiation Protection in the Mining and Milling of Radioactive Ores, and to carry out measurements of radon progeny aerosol parameters for the current Jabiluka ventilation conditions. The data collected will be used to assess the ventilation models used for environmental impact statements for such underground mines.

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

Ultraviolet Protection Factor (UPF) Fabric Testing and Labelling

Drafting of documentation for accreditation of the UPF rating service is underway. The UPF Quality Management Committee meets regularly and the National Association of Testing Authorities (NATA) initial assessment before mid-2001 is anticipated.

A number of commercial agreements were made for the acceptance of test reports of external commercial fabric testing facilities for use with ARPANSA UPF swing tags.

Fabric UPF testing, licensing and labelling was reduced – as is normal for this quarter. For the quarter 67 fabric samples were tested, nine UPF Trademark licenses were issued and 446,500 UPF labels were issued.

EMR & Optical Radiation

Significant progress has been made in the quality management of ARPANSA services. NATA conducted a preliminary audit of the EMR calibration service area during mid year. By December all recommendations had been addressed and revised documentation had been forwarded to NATA.

There was a continuing strong demand for commercial service work including the laboratory calibration of 57 RF monitors, 84 probes and 16 badges.

Environmental and Radiation Health Services

Baseline in-situ radiation measurements and soil sampling were conducted at three potential sites in the Woomera area for the National Radioactive Waste Repository.

A major assessment of health risks associated with the disposal of NORM (naturally-occurring radioactive materials) wastes resulting from Bass Strait oil and gas production was completed.

(e) COUNCIL AND COMMITTEE OPERATIONS

Radiation Health & Safety Advisory Council

The Council met on 1 December 2000 at ARPANSA's Yallambie office. A summary of the meeting is at http://www.arpansa.gov.au/rhsac_m2.htm.

The next meeting is scheduled for 9 April 2001.

Radiation Health Committee

The Radiation Health Committee (RHC) met on 1 and 2 November 2000 at ARPANSA's Yallambie office. A summary of the meeting is at http://www.arpansa.gov.au/rhc_mt.htm.

The next meeting of the Radiation Health Committee is scheduled for 28-29 March 2001.

Nuclear Safety Committee

The Nuclear Safety Committee (NSC) met on 10 November 2000 at ARPANSA's Miranda office. A summary of the meeting is at http://www.arpansa.gov.au/nsc_mt.htm.

The next meeting was scheduled for 16 March 2001.

Radiofrequency (RF) Exposure Standard Working Group

The RF Exposure Standard Working Group met on 19 and 20 October, 27 and 28 November and 19 and 20 December 2000 at ARPANSA's Yallambie office.

A further meeting is scheduled for 23 and 24 January 2001. The working group hopes to have a draft available for public comment after the January meeting.

(f) REGULATION

Standards

Source Licence Conditions

The *ANSTO Handbook* was completed during this quarter. This handbook sets out the General, ANSTO-wide Standing and Time-related Conditions and the Standing and Standard Conditions for ANSTO Source Licences and was part of the ANSTO source licences issued during the quarter.

Regulatory Assessment Guidelines

The following documents were reviewed by working groups of the Nuclear Safety Committee and were made available for public comment:

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

Licensing

Application Assessment

During the quarter:

- One facility licence application and nine source licence applications were received.
- Seven combined source licences were issued to: Agriculture, Fisheries and Forestry - Australia, Australian Quarantine Inspection Service, Brisbane International Mail, Department of Foreign Affairs and Trade, Therapeutic Goods Administration Laboratories, National Gallery, ANSTO Engineering, ANSTO Materials and ANSTO Environment. These combined source licences authorise dealings with 95 individual sources.
- Two facility licences were issued to Department of Industry, Science & Resources (Maralinga) and Parks Australia.
- One combined source licence was amended.

Australian Nuclear Science and Technology Organisation (ANSTO)

The Safety Evaluation Report on ANSTO's General Plans and Arrangements was completed. The report took into account relevant public submissions and recommended a number of licence conditions to be applied to all Facility Licences or Source Licences that might be issued to ANSTO.

Safety Evaluation Reports were completed for the Engineering, Materials and Environment Divisions.

Three source licences for ANSTO Environment, Engineering and Materials Divisions were issued during this quarter. The assessment of source licence applications from Physics Division and the Safety Division is in progress.

HIFAR

A review of the HIFAR reactor against the *ARPANSA Expectations for General Plans and Arrangements* and the *ARPANSA Draft Regulatory Assessment Principles* was completed. This review will be used as the basis of the safety evaluation report for the HIFAR licence application.

Moata

A meeting to clarify some licensing issues was held with Moata staff in early October. They indicated they were committed to satisfying ARPANSA's requirements to obtain a licence for Care and Maintenance of the de-fuelled reactor.

Waste

ANSTO provided additional information in support of their licence application for the Waste Operations and Technology Division (Part 4B of the Application).

Department of Industry, Science & Resources

A Safety Evaluation report was written by the Regulatory Branch and a licence was granted to the Department of Industry, Science and Resources to allow the management and proposed eventual return of the Maralinga atomic test site to its traditional owners.

Parks Australia North

A licence was granted to enable the Director of National Parks to carry out preliminary remediation of abandoned uranium mines and associated sites in the South Alligator Valley of Kakadu National Park. During a visit to assess requirements for the next stage of proposed remediation the completed work was examined.

Surveillance

Criticality Audit

A criticality audit of ANSTO was conducted during the quarter and an audit report was drafted. The report includes a number of requirements for ANSTO's criticality safety arrangements. These will be addressed through the licensing process.

HIFAR

A log audit of the Control Room Log Book was undertaken.

CSIRO Black Mountain

Radioactive waste storage arrangements at the CSIRO Black Mountain site were inspected as a consequence of relocation and consolidation of material from several other CSIRO Divisions. These arrangements were found to be acceptable.

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

Abnormal Occurrences – Actinide Suite

ANSTO provided the Safety Division report of the previously reported incident in the Actinide Suite involving a staff member preparing to load a radioactive 'leach sample' into a leaching vessel. The report concludes that there were no health impacts to staff relating to this incident. ANSTO is confident that all controlled material is under effective control.

ARPANSA will use information obtained from this incident to assist in the evaluation of the licence applications for the Actinide Suite and Waste Operations.

HIFAR Abnormal Occurrences¹

During the quarter there was one abnormal occurrence notified by ANSTO that was classified by ARPANSA as INES Level 1, *i.e.* an anomaly beyond the authorised operating regime. This involved the failure, while the reactor was shut down, of one of the two safety rods to drop during routine testing prior to making changes to the reactor core. After manipulation of the safety rod cable, three further test drops were successfully performed and the core changes proceeded before the root cause of the failure was determined. Subsequent investigation showed that a loose cable guide tube was the root cause.

1 ARPANSA is notified of all abnormal occurrences at HIFAR but only includes in this report those classified as Level 1 and above on the International Nuclear Event Scale (INES) as all others are of no safety significance.

Modifications to Other Nuclear Installations

The First Stage Submission for the upgrade of Building 54 Ventilation System has been reviewed. Building 54 is a unit of Radiopharmaceuticals Division housing the fission molybdenum processing plant. This upgrade is a significant change to the Radiopharmaceuticals facility. ARPANSA agreed to the submission subject to appropriate conditions.

HIFAR Plant and Procedure Modifications

ARPANSA reviewed and agreed to safety-related modifications to a space conditioning system and experimental facilities.

Replacement Reactor Site Licence

ARPANSA reviewed ANSTO's compliance with the site licence based upon the quarterly reporting requirement. All licence conditions continued to be met by ANSTO.

ARPANSA convened a two-day workshop in Canberra in November 2000 that brought together scientists and engineers with expertise in Australian seismic hazards. The purpose of the workshop was to review the various comments on the Alliance report, commissioned by the Department of Industry, Science and Resources, which undertook a probabilistic seismic hazard analysis (PSHA) for the Lucas Heights area. The review concluded that the Alliance report was a state of the art PSHA, but that some assumptions in the study might be worthy of some further examination. The workshop identified a number of tasks that would expand the logic tree of parameter inputs for the Lucas Heights PSHA in order that the model could be re-run, and take into account a wider sample of Australian seismic expertise.

Radioactive Discharges

ANSTO is required to regularly report radioactive airborne discharges from HIFAR. The discharges during the quarter were found to be in compliance with the airborne discharge authorisation issued by ARPANSA. All discharges were less than the notification levels specified in the authorisation related to ANSTO's ALARA (as low as reasonably achievable) objective of 20 microsieverts per year.

ANSTO reported liquid discharges from the Lucas Heights Science and Technology Centre. These were in compliance 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

International Atomic Energy Agency (IAEA)

- In December, the CEO took part in an IAEA Conference held in Argentina aimed at improving the systems in place for the control of sources and attended by regulators from nearly 80 countries. In addition, he visited INVAP, the company that has the contract to build the ANSTO replacement research reactor, for discussions about the process of assessing the licence application to construct the reactor; the Chalk River laboratories in Canada; the Canadian Nuclear Safety Commission and the US Nuclear Regulatory Commission and other US Agencies.
- Mr Vince Diamond met with officials of the IAEA in Vienna to discuss agency involvement in the independent peer review of the *Preliminary Safety Analysis Report* for the replacement research reactor.
- In November, Dr Lindsay Martin attended a workshop on Environmental Measurements and Regional Database under the auspices of the IAEA Regional Co-operative Agreement for the Asian region, in Bombay, India in November. The results of an intercomparison of analyses of low-energy gamma-ray emitters and of strontium 90 carried out within participating member states in the region were presented.
- Mr Phil Mabbott attended an IAEA course conducted over three weeks in November at the Argonne National Laboratory, Illinois in the USA. The course covered Decommissioning Strategies, Site/Facility Characterisation, the Regulatory Process, Spent Fuel and Waste Management.
- Drs Rick O'Brien and Malcolm Cooper organised and attended an IAEA research coordination meeting in Perth from 13 to 17 November on the FACTS (Formulation of Approaches to Compare the potential impacts of waste from electricity generation Technologies) Coordinated Research Project. At this meeting, contractors reports were presented and the on-going research program into public health aspects of both chemical and radioactive wastes from electricity generation was reviewed.

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

Dr Colin Roy participated in an ICNIRP Standing Committee meeting in San Antonio, Texas during 10-17 November 2000. The two major tasks were the drafting of ICNIRP statements on various EMR issues and finalising the drafting of chapters for the book "Exposure characteristics, biological effects, human studies, health effects and risk assessment of static and time varying electric and magnetic fields (0 to 100 kHz).

Dr Colin Roy participated in an 'International workshop on the UV Index' co-sponsored by ICNIRP, WHO, UNEP and WMO and held in Munich, Germany from 29 November to 11 December 2000. The meeting sought to reach international consensus on characteristics and application of a "Global UV Index" and draft an update of the Global Solar UV Index (ICNIRP-1/95) booklet. Dr Roy was also invited to participate in an ICNIRP Standing Committee on Optics meeting in Munich to help draft an International Labour Organisation document on UVR protection for outdoor workers.

In collaboration with the Institute for Terrestrial and Planetary Atmospheres of the State University of New York a paper 'Comparison of measurements of surface UVR and TOMS satellite data over Australia: Health Implications' (Udelhofen, Gies & Roy) was presented at the SPARC - 2000 (Stratospheric Processes and their Role in Climate) Congress in Mar del Plata, Argentina in November 2000. The paper will appear in a special issue of the *Journal of Geophysical Research*.

Comprehensive Test Ban Treaty (Comprehensive Test Ban Treaty)

In November, Dr Lindsay Martin attended an Experimental Advanced training course of CTBT On-site Inspections held in Snezhinsk in the Russian Federation.

Asia Pacific Metrology Program

Dr David Webb attended the Asia Pacific Metrology Program 16th General Assembly and Workshops held in Thailand from 6 to 11 November.

Nuclear Energy Agency (NEA)

Mr Vince Diamond participated in a workshop, "Investing in Trust—Nuclear Regulators and the Public" in Paris organised by the NEA entitled from 29 November to 1 December 2000. The workshop was attended by about 80 participants with public information and regulatory responsibilities within nuclear regulatory bodies.

He also attended the Committee on Nuclear Regulatory Activities and Committee on Safety of Nuclear Installations (CSNI) meeting held in Paris from 4 to 8 December 2000. The topics discussed included:

- means of maintaining nuclear research at a time of reduced budgets and loss of expertise;
- impact of organisational changes on the safe operation of nuclear power plants;
- measurement of regulatory effectiveness through direct and indirect performance indicators;
- the uses of deterministic and probabilistic approaches in plant life extension;
- improving or maintaining safety as a regulatory aim;
- review of common cause failures in diesels and pumps;
- risk informed inspection and the effectiveness of licensee self inspection;
- effective interactions between CSNI and IAEA; and
- new power reactor designs.

John Loy
CEO
9 February 2001