



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 APRIL TO 30 JUNE 2003



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 APRIL TO 30 JUNE 2003

© Commonwealth of Australia 2003
ISSN 1444 - 4380

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Commonwealth available from AusInfo.

This report and supplementary papers can be accessed through the Internet at http://www.arpana.gov.au/is_idx.htm. The electronic version of this report is also copyright. You may download, display, print and reproduce this material in unaltered form only (retaining this notice) for your personal, non-commercial use or use within your organisation. All other rights are reserved.

Requests and inquiries concerning reproduction and rights should be addressed to the Manager, Legislative Services, AusInfo, GPO Box 1920, Canberra, ACT 2601 or by email to: Cwealthcopyright@dofa.gov.au.

Produced by the
Australian Radiation Protection and Nuclear Safety Agency
619 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>.

Inquiries about the content of this report should be directed to the Public Affairs Officer.

Printed by

CanPrint Communications Pty Ltd
16 Nyrang Street
Fyshwick ACT 2609

CONTENTS

Contents	iii
Foreword	1
Report on Performance	1
1. Uniformity of Radiation Protection Frameworks	1
2. Advice on Radiation Protection and Nuclear Safety	2
3. Research on Radiation Protection, Nuclear Safety and Medical Exposures to Radiation	4
4. Services Provided in Radiation Protection, Nuclear Safety and Medical Exposures to Radiation	6
5. Council and Committee Operations	8
6. Regulation	8
7. International Liaison	21

FOREWORD

The *Australian Radiation Protection and Nuclear Safety Act 1998* (ARPANS Act) requires the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency to submit to the Minister, at the end of each quarter, a report on the operations during the quarter of the CEO, ARPANSA and the Council and Committees constituted under the Act.

The quarterly report should also include details of any direction given by the Minister to the CEO under Section 16 of the Act; any breach of licence conditions by a licensee, of which the CEO is aware; all reports received by the CEO from the Radiation Health and Safety Advisory Council and the Nuclear Safety Council on radiation protection, nuclear safety and the safety of controlled facilities and details of facilities licensed under Part 5 of the Act.

Further details about matters contained in this report are available through the ARPANSA Public Affairs Officer who can be contacted by telephone on 02 9545 8333, by facsimile on 02 9545 8314 or by e-mail to arpansa@health.gov.au.

REPORT ON PERFORMANCE

1. Uniformity of Radiation Protection Frameworks

National Directory for Radiation Protection

- 1.1 Following consideration of public comments received during the first quarter of 2003, a further draft of the National Directory for Radiation Protection was prepared for consideration by the National Uniformity Implementation Panel (Radiation Control) at its June 13 meeting. Issues relating to mutual recognition, criteria for registration of radiation equipment and licence conditions were identified as requiring further development.

A draft regulatory impact statement (RIS) was prepared and forwarded to the Office of Regulation Review (ORR) for comment. The ORR identified four areas requiring analysis: practices to which legislation applies, exemptions, services for rural and remote areas, and categories of registration.

National Competition Policy Review of Radiation Protection Legislation

- 1.2 The Allen Consulting Group Pty Ltd has been appointed to carry out NCP review projects three and four (Regulatory Styles and Third Party Certification respectively). Project three is scheduled for completion during the third quarter of 2003. Project four is scheduled for completion during the fourth quarter of 2003.

2. Advice on Radiation Protection and Nuclear Safety

Comprehensive Test Ban Treaty – air sampling monitoring systems

- 2.1 Installation of the radionuclide station in the Cocos Islands was completed in the quarter, and a testing and evaluation program for the station commenced. The Provisional Technical Secretariat undertook a certification visit to the Cocos Islands, June 13-16.

Nuclear powered warships

- 2.2 ARPANSA officers participated in the biennial Visiting Ships Panel (Nuclear) (VSP(N)) seminar held at the Emergency Management Australia premises at Mt Macedon, Victoria. State and Territory participants were briefed on the implications of revised recommendations on interventions for radiation emergencies being developed by the Radiation Health Committee.
- 2.3 The Health Physics Section maintained on-call teams, and analysis of environmental samples were carried out for nuclear powered warship visits. There were three visits to Stirling in April, one visit to Brisbane in May and another visit to Stirling in June. Ten environmental samples from ports were received and measured in the quarter.

Conferences, meetings and technical advice

Non-Ionizing Radiation Branch

- 2.4 A meeting of the Radiation Health Committee (RHC) working group to revise Radiation Health Series No.37 “*Code of practice for the safe use of lasers in the entertainment industry*” (1995) was held on May 29.
- 2.5 Wayne Cornelius also attended a meeting of the National Association of Testing Authorities (NATA) Optics and Radiometry Accreditation Committee on May 7.
- 2.6 Wayne Cornelius (member of Standards Australia CH-026-5) attended a May 30 Sydney meeting to resolve comment on the public comment draft of the revised AS 2243.5 Standard “*Safety in Laboratories: Non-Ionizing Radiations*” (DR 02640).
- 2.7 Wayne Cornelius and Ken Karipidis attended meetings of the RHC’s working group to develop an ARPANSA extremely low frequency (ELF) radiation protection standard (April 1-May 22). A database was established to collect post-year 2000 literature relevant to ELF. The literature will be reviewed by the working group and be considered in development of the ELF standard.
- 2.8 Peter Gies provided input to the Cancer Council of Victoria on its draft guidelines titled “*Shade for Everyone*”. Advice on UVR dosimeters was also provided to the New Zealand Cancer Society.
- 2.9 Peter Gies co-wrote a paper titled “*Progress in CIE TC 6-29 – UV Protection and Clothing*”, which another author presented at the 25th Quadrennial Session of the

International Commission on Illumination (CIE) in San Diego, June 23-26.

- 2.10 International Commission on Non-Ionizing Radiation Protection (ICNIRP) Statement “*Guidance on determining compliance of exposure to pulsed and complex non-sinusoidal waveforms below 100kHz with ICNIRP Guidelines*” was published in Health Physics, 84, 383-387. Colin Roy is a member of ICNIRP Standing Committee III, which drafted the statement.

Medical Radiation Branch

- 2.11 Zlata Ivanov and Ilonka Bokor attended the 33rd annual scientific meeting of the Australian and New Zealand Society of Nuclear Medicine in Sydney May 10-13 and presented a poster “*The effect of irradiation on the radiochemical purity of Diethylhida (Etifenin) kits*”.
- 2.12 A paper was submitted to the Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM) journal entitled “*Radiation doses from CT in Australia through the years 1994 – 2002*”. This paper uses the procedure doses from the 1995 national survey and presents updated population dose estimates based on Medicare examination frequency data over the period.
- 2.13 Dave Webb visited the National Physical Laboratory (UK) in May to finalise a joint publication titled “*A Comparison of Absorbed Dose Standards for Cobalt-60 and Megavoltage Photon Radiation*”.

Regulatory Branch

- 2.14 Two officers attended a meeting at the Australian Nuclear Science and Technology Organisation (ANSTO) to develop a pilot training course in radiation emergencies for State Emergency Services managers.
- 2.15 An officer attended a meeting of the Local Liaison Working Party and presented information on studies of the radiological consequences of acts of sabotage and terrorism involving ANSTO facilities.
- 2.16 Implementation of the inspection training and skills development program for inspectors continued. Two officers attended a course in Writing Reports of Investigations. ARPANSA’s Corporate Counsel conducted a second legal awareness seminar. A registered training organisation was contracted to provide training for inspectors leading to the Certificate IV in Government (Statutory Investigation and Enforcement) during 2003-2004.
- 2.17 An officer gave a presentation to the NSW Branch of the Australasian Radiation Protection Society titled “*Activities of NEA Committees and Expert Groups. Developments in Radiation Protection*”.

Environmental and Radiation Health Branch

- 2.18 ARPANSA has been involved in several Commonwealth activities associated with planning and preparedness for radiological and nuclear emergencies. An officer attended a meeting on critical infrastructure for emergencies as a member of a Health and Ageing delegation, and the National CBR (Chemical, Biological and Radiological) Working Group, to advise on radiological issues.

Public communication activities

- 2.19 Non-Ionizing Radiation (NIR) Branch staff continued to provide information to the public regarding electromagnetic emissions (EME) and health. Requests for information varied but residential exposure to high voltage powerlines and mobile phone base stations continued to dominate.
- 2.20 A new series of EME Fact Sheets being developed by Non-Ionizing Radiation Branch staff, and other members of the Government's Committee on Electromagnetic Energy Public Health Issues (CEMEPHI), reached the final draft stage. It was envisaged they would be available on the ARPANSA website by the end of July.
- 2.21 NIR staff further developed processes for members of the public to lodge a complaint with the proposed Electromagnetic Radiation (EMR) Health Complaints Register. A draft reporting form was circulated to the EME Reference Group (EMERG) for comment. NIR staff designed a database to store the register reports. The register was launched by an ARPANSA media release on July 4.
- 2.22 The Public Affairs Officer responded to numerous phone and email inquiries. Most commonly, people requested information about health issues concerning magnetic fields from such things as powerlines, transformers, substations, and meter boxes. Other topics of interest included the possible health effects of mobile phones and base stations, radiation leakage from microwave ovens, ultra-violet radiation (UVR) exposure, and ANSTO's operations at Lucas Heights.
- 2.23 Visitors to the ARPANSA website who download a single file are logged as a single hit. ARPANSA's site received a total of 160,286 successful 'hits' in the quarter, or a 71.6 per cent increase compared to the previous one (n. 93,382).

3. Research on Radiation Protection, Nuclear Safety and Medical Exposures to Radiation

Non-ionizing radiation

- 3.1 The manuscript on a collaborative study between ARPANSA and Workplace Health and Safety Queensland on solar UVR exposures of outdoor workers in the building industry in Queensland was accepted for publication in Photochemistry and Photobiology.

- 3.2 The collaborative study with the Menzies Centre for Population Health in Hobart and the National Centre for Epidemiology and Population Health at the Australian National University (ANU) continued, with the winter phase of UVR exposure assessments of subjects with multiple sclerosis being completed. The UVR sensitive badges were returned to ARPANSA and were re-measured and analysed. The next phase will be measurement of exposures during the summer of 2003-2004.
- 3.3 ARPANSA, in conjunction with Tandou Pty Ltd, completed the first stage of a study of UVR exposures of agricultural sector outdoor workers in three different states (Victoria, New South Wales and South Australia). As Mildura has significant clear sky during winter a second stage, measurement of UVR exposures in winter, will be carried out in July-August. This will be followed by a final stage during the height of summer (December-January). Such a study has not been done before.
- 3.4 As part of World Health Organisation (WHO)/World Meteorological Organisation recommendations for standardising solar UVR measurements, an intercomparison of solar UVR detectors and their calibrations commenced with the University of Southern Queensland (USQ) at Toowoomba. USQ hosted an ARPANSA UVR datalogger for three months (February-April) and applied calibrations to the unit, allowing comparison with the ARPANSA traceable calibrations.
- 3.5 A collaborative study with Dr Cheryl Wilson of the Clothing and Textile Sciences Faculty of the University of Otago in Dunedin commenced. The aim is to systematically characterise the factors that ensure clothing provides good protection against solar UVR, as well as those that provide poor protection. A sample set of approximately 200 fabrics from the ARPANSA fabric testing database archive was being examined with specialized fibre technology equipment to determine and classify material characteristics. These details will then be correlated with the spectral transmission data held by ARPANSA.
- 3.6 NIR staff prepared a proposal for a Victorian residential ELF exposure survey.
- 3.7 A proposal to conduct a survey of radiofrequency (RF) EME emissions around sixty mobile phone base stations at locations around Australia was prepared. The objective is to measure base station RF radiation levels at specified distances from the antenna and compare levels with the ARPANSA RF exposure limits and with predicted levels. A tender has been opened for contractors to undertake the measurements. A completed report is expected by the end of 2003.

Medical radiation

- 3.8 The Medical Physics Section continued its national survey on radiation doses from general diagnostic radiology. Privacy laws in Queensland prevented the Queensland Health Department from providing the names and addresses of contacts for x-ray equipment. After lengthy negotiations the Queensland Health Department sent out invitations to participate in the survey on ARPANSA's behalf. The survey now covers all States and Territories of Australia. The first round of the radiation output calibrations and patient data collection for 50 randomly selected x-ray units was

completed. This has yielded data on about 6,000 x-ray projections on patients.

- 3.9 In the March quarterly report it was noted that the Medical Physics Section was performing a limited survey, in Sydney, of the field sizes used by radiographers in relation to the size of image receptor (generally film). This was being done so that the average contribution to the dose from 'wasted' exposure, which occurs outside the receptor, could be estimated. Data collection and analysis for this project was completed in the June quarter.
- 3.10 Results of the first batch of the national therapy quality assurance dosimetry audit were still being finalised in the quarter. Nonetheless, they indicated that all centres have been within the accepted band. The second batch of the audit, involving four centres, with exposures performed in the last week in May returned was being assessed at the end of the quarter. A third batch was being arranged.

4. Services Provided in Radiation Protection, Nuclear Safety and Medical Exposures to Radiation

Calibration services

- 4.1 The Non-ionizing Radiation Branch Radiofrequency Calibration (RFC) Laboratory completed 94 calibration jobs (633 frequency measurements) during the quarter. The Branch responded to issues raised by NATA and made additional improvements to the quality and efficiency of RFC service procedures, such as the automated generation and analysis of quality control charts.
- 4.2 Medical Radiation Branch's Ionizing Radiation Standards (IRS) Section dosimetry calibration service for external clients commenced four, completed two therapy calibrations, and commenced protection level calibrations for the RAAF (Williamstown) and ANSTO. Five protection level calibrations were undertaken for several ARPANSA areas. New procedures were developed to calibrate digital personal dosimeters for the Regulatory Branch.
- 4.3 The IRS Section submission for accreditation of the caesium-137 protection level calibration facility was sent to the National Association of Testing Authorities, Australia (NATA).

Fabric testing and labelling

- 4.4 Fabric ultra-violet protection factor (UPF) testing, licensing and labelling continued. One hundred and sixteen jobs were received, involving the testing of 487 fabric samples. In addition, 38 UPF trademark licences were completed and 1.4 million UPF swing tags were issued. Nine pairs of sunglasses were tested for their UVR protection properties during the quarter.

UVR data and hazard assessments

- 4.5 Four industrial UVR hazard assessments were completed, namely:
- UVR hazards from welding for a South Australian company;
 - Solar UVR hazards through skylights in a Melbourne workplace;
 - UVR hazards from transilluminators for the Children's Cancer Institute in Sydney; and
 - Hazard assessment of employee exposure to UVR in a printing firm.
- 4.6 UVR data was provided to a research program carried out at the Cooperative Research Centre for Freshwater Ecology at Monash University School of Biological Sciences. UVR data for Sydney was provided to the National Weather Service of Uruguay. UVR data was also provided on a commercial basis to two Australian companies.

QA program for radiopharmaceutical products

- 4.7 All batches of radiopharmaceuticals tested in the quarter complied with specifications.

Surveillance of effluent discharges at ANSTO's HIFAR reactor

- 4.8 A total of 39 samples of liquid effluent discharges and filters used to monitor gaseous discharges were received and measured for their radioactivity during the quarter.

Measurement of radioactivity in drinking water

- 4.9 501 samples were tested against requirements of the Australian Drinking Water Guidelines.

Certification of radioactivity in exported foodstuffs

- 4.10 Measurements of the radioactivity content of 13 foodstuffs destined for export were carried out on request and 6 Radioactivity Certificates were issued for shipments of exported foodstuffs.

Personal Radiation Monitoring Service

- 4.11 The Personal Radiation Monitoring Service (PRMS) of ARPANSA was involved with an international intercomparison of personal dosimetry conducted by the South African Bureau of Standards. The radiation beams investigated were x-rays and high-energy gamma rays. The PRMS results were well within acceptable limits and the intercomparison was a success.

5. Council and Committee Operations

Radiation Health and Safety Advisory Council

- 5.1 The council met on April 4 in Melbourne. A summary of the meeting is available at <http://www.health.gov.au/arpansa/rhsac.htm>.

Radiation Health Committee

- 5.2 The committee did not meet during the quarter.

Nuclear Safety Committee

- 5.3 The committee met on June 20 in Melbourne. A summary of the meeting is available at <http://www.arpansa.gov.au/nsc.htm>.

Radiation Protection Series publication program

- 5.4 RIS for the *Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation* and the *Code of Practice and Safety Guide for Radiation Protection in Dentistry* were sent to the ORR during the quarter. ARPANSA received clearance from the ORR for the UV Standard RIS in June and the draft *Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation* and its RIS were then released for public comment during the quarter.

6. Regulation

Licensing

Licence Applications

- 6.1 One new source licence application was received in the quarter from the Attorney General's Department. An amended licence application, including a revised Safety Assessment Report, was received from ANSTO Environment for the relocated Radiotracer Facility, formerly known as the Radioisotope Storage Facility.
- 6.2 No new facility licence applications were received in the quarter.

Application Assessment and Licence Issuance

- 6.3 Application and licence reviews resulted in the following licensing decisions:
- The regulatory assessment of facility licence applications for operation of Australian National University accelerators was completed during the quarter and resulted in the CEO of ARPANSA issuing a facility licence for operation of three accelerators.
 - The issue of a facility licence to ANSTO to operate the controlled facility known as the Secondary Standards Dosimetry Laboratory.

- The issue of a source licence to Australian Government Analytical Laboratories (AGAL) authorising dealings with controlled apparatus and controlled material.

Import Permits issued under the Customs (Prohibited Import) Regulations 1956

- 6.4 The Regulatory Branch issued 119 Customs Prohibited Release permits for the importation of non-medical radioisotopes. These were comprised of 90 single-shipment, 21 urgent requests and eight twelve-monthly permits.
- 6.5 The Radiopharmaceutical Section issued 96 Customs Prohibited Release permits for the importation of medical radioisotopes. These were comprised of 77 single-shipment permits, 13 twelve-monthly permits and six faxed permits.

Monitoring compliance under the ARPANS Act

ANSTO - Replacement Research Reactor Site Licence

- 6.6 The 15th quarterly report by ANSTO on its compliance with the *Replacement Research Reactor Facility Licence, Site Authorisation* was evaluated by Regulatory Branch. Satisfactory compliance with the conditions of licence was demonstrated.

ANSTO - Replacement Research Reactor Construction Licence

- 6.7 ANSTO submitted nineteen requests for approval (RFAs) by the CEO of ARPANSA for construction of items important for safety, in accordance with Regulation 54 and licence condition 4.6. Seven of these received CEO approval during the reporting period, in addition to three that were submitted earlier.

The CEO has not imposed any additional licence conditions under Section 36(2)(a) of the ARPANS Act during the quarter.

ANSTO - HIFAR Reactor Operations

- 6.8 The quarterly report on compliance with licence conditions and other reportable items was received. This included the status of plant modifications and engineering projects between April and June 2003. Six new projects were identified during the quarter and all but one was assigned a safety classification. None of the new projects was identified to be safety significant, all meeting ARPANSA approvals. 13 projects were in progress, while a further five had reached practical completion and eight had reached final completion.
- 6.9 ARPANSA assessment of an ANSTO proposed change to operational safety limit and conditions relating to the allowed reactivity worth of irradiation rigs in the HIFAR reactor was still underway. ARPANSA comments on the proposal were being considered by ANSTO.
- 6.10 ARPANSA assessment of an ANSTO proposal to change the operational safety limit relating to surface heat flux of irradiation rigs in the HIFAR reactor was still underway.

- 6.11 ARPANSA continued reviewing an ANSTO proposal to amend a condition relating to plant staffing.
- 6.12 Routine contact visits by Regulatory Branch staff to monitor HIFAR operations and maintenance continued during the quarter. These provided the opportunity for officer to officer discussions on licensing and other regulatory issues.

ANSTO Sources

- 6.13 **Planned Inspections**
Planned inspections were conducted of ANSTO Safety and Radiation Science and ANSTO Environment. Final inspection reports were prepared and issued by Regulatory Branch. Inspections verified satisfactory compliance with licence conditions.
- 6.14 **ANSTO Environment**
An update of source inventory information and quarterly report was received. Satisfactory progress on compliance with special licence conditions was noted. A temporary change in nominee for the period June 23 to January 4 (2004) was reported.
- 6.15 **ANSTO Safety and Radiation Science**
A temporary change of nominee for the period April 18 to July 22 was reported. A report on compliance with special licence conditions transferred with Physics Division sources was received. Satisfactory progress was noted.
- 6.16 **ANSTO Engineering**
No changes to source inventory information were reported.
- 6.17 **ANSTO Materials**
No changes to source inventory information were reported.
- 6.18 **Bragg Institute**
No changes to source inventory information were reported.

ANSTO Inspections

- 6.19 Regulatory Branch officers visited the National Medical Cyclotron at Camperdown in Sydney to check the performance of a portable gamma-spectroscopy and radiation monitoring system.
- 6.20 Two Regulatory Branch officers visited Building 57 to gather further information about the upgrade of a nuclear graded crane.
- 6.21 One Regulatory Branch Officer visited the Ore Processing Operation Facility and 2MV Tandetron Facility to obtain further information for assessment of the licence applications for these facilities.

- 6.22 A planned inspection was carried out at the Building 23 Cropping Pond, a unit of the ANSTO Fuel Management facility that is operated under Licence No. FO 0044-4C. A final inspection report was prepared for this inspection. Although no item was identified as being in non-compliance with the licence conditions during the inspection, the Final Incident Report and the internal ANSTO investigation report were under ARPANSA review for further follow up. In addition, follow up actions on the results of gamma spectroscopy and dose estimation and calculation procedures for abnormal occurrences progressed in the quarter.
- 6.23 As part of the compliance review of the licence to operate the HIFAR reactor, one inspection of the HIFAR Control Room Log was carried out in the quarter. It indicated that the usual high quality standard of log keeping had fallen slightly, so a letter was sent to the Manager of HIFAR Operations bringing this to his attention.
- 6.24 There were three other inspections made to HIFAR during the quarter. Two related to maintenance and one to fuel handling.
- 6.25 There was also one routine inspection made to Waste Section's new building for the processing of low level radioactive waste that may be transported to the proposed waste repository.
- 6.26 A planned compliance inspection of the Moata facility under its Decommissioning Licence (FO0044-6A) was carried out during the quarter. The inspector found that the facility was generally well kept with good house-keeping arrangements. The licence holder representatives were knowledgeable of safety and regulatory matters and responsive to the inspection. Security measures for the fuel storage are satisfactory. Items inspected complied with the licence conditions.

ANSTO – Moata Research Reactor

- 6.27 As required by the conditions of licence, Moata supplied a quarterly report within 28 days from the end of the quarter that stated:
- No abnormal occurrences occurred in relation to the operation of Moata;
 - No modifications to plant and procedures were identified as necessary for the care and maintenance of the Moata facility;
 - No modifications or changes were initiated during the quarter;
 - No reactivity was released to the environment;
 - The facility including fuel storage was inspected by the International Atomic Energy Agency (IAEA) during the quarter. Two new IAEA seals and two new ASNO seals were added to the fuel storage facility. No item was identified as not complying; and
 - The facility was inspected by ARPANSA (on May 28). Items inspected were found to comply with the licence conditions.

ANSTO Fuel Operations

- 6.28 ARPANSA received a quarterly report on compliance with licence conditions.
- 6.29 Progress in satisfying special licence condition 3.7(e) in Facility Licence No. FO0044-4C reached the point where ANSTO commenced a repackaging trial of fissile material during the IAEA inspection in April. The repackaging will be completed during the next scheduled IAEA inspection in July.
- 6.30 An upgrade of the Building 23 spent fuel storage pond purification system was in progress. The maintenance management plan for the fuel storage pond facility was being implemented. A high priority was given to further reducing contamination of water in the Building 23 storage pond caused by the fuel cropping incident in March 2002.

ANSTO Waste Operations and Technology Development

- 6.31 ARPANSA received a report covering the previous quarter and it addresses the following areas:
- 6.32 **Safety Analysis**
A special licence condition requires the licence holder to submit the final safety analysis reports for the facilities of Waste Operations and Technology Development. Accordingly, the licence holder submitted four safety analysis reports that were under ARPANSA review during the quarter.
- 6.33 **Abnormal Occurrences**
An abnormal occurrence involving release of tritium (H3) was reported to ARPANSA. This issue is considered separately in the section below titled “*Airborne Discharges*”.
- 6.34 **Modifications**
ARPANSA received a submission seeking approval to occupy the Waste Treatment and Packaging Building (20B) and utilise the laboratories within the building. The submission is currently under ARPANSA review. Some plant and equipment have been purchased for installation and commissioning in this building during 2003.
- 6.35 **Airborne Discharges**
A four-weekly notification level was triggered for H-3 tritium at the end of the previous quarterly period as a result of the processing of a HIFAR ion exchange column. ARPANSA was notified about this release of H-3. The quarterly discharge level remained below the quarterly notification level.
- 6.36 **Liquid Discharges**
The quarterly report shows that the effluent plant discharges from ANSTO’s Liquid Waste Treatment Plant were below the Trade Waste Discharge Limit. The liquid discharge results are also covered separately under the section titled “ANSTO Liquid Radioactive Discharges”.

6.37 **Inventories**

- The updated inventories stored on the Lucas Heights Science and Technology site and all changes in stored inventories occurring in this quarter were presented in this quarterly report.
- It was reported that there were no changes to the nuclear materials under Safeguards administration.
- The updated list of the source register is presented in this quarterly report.

ANSTO Radiopharmaceuticals and Industrials

6.38 ARPANSA received a report for the quarter addressing these areas:

6.39 **Modifications**

Refurbishment of the Building 23 administration offices and foyer was completed. The staff amenities area and outside courtyard were in the process of completion. The covered corridor between Building 23A and 23C was completed.

6.40 **Relevant Changes**

Under Regulation 51, the CEO approved the conceptual design of the redevelopment of Building 23 (B 23 Extension).

The Production Manager was given the responsibility of the Cyclotron operations while the Cyclotron Operations Manager was on leave. The cyclotron engineer now reports to the Production Manager. Such a change is unlikely to have significant implications for safety and reporting of this change satisfies Regulation 52.

6.41 **Effective Control**

A special licence condition requires maintaining a current inventory of all controlled materials and controlled apparatus. The ARI quarterly report mentioned that there was no change in inventory.

6.42 **Safety Management Plan**

A special licence condition requires formal accreditation of operators. The ARI quarterly report mentioned that all production and quality control (QC) operators attended a workshop on the learning unit titled "*Products/Processes and Good Manufacturing Practice*". All production and QC operators, including staff at the Cyclotron, have now been certified.

Similar workshops for the remaining staff from the National Medical Cyclotron and Radiopharmaceuticals Research and Development have been completed.

The quarterly report mentioned that the second learning unit "*Radiation Safety in Our Plant*" had been finalised and operators will be working towards certification on this next unit. It is envisaged that all operators will be certified to this unit by the end of next quarter.

A special licence condition requires an engineering assessment of programs for maintenance, along with periodic inspection and testing of structures, systems and

components important to safety of each facility within Radiopharmaceuticals Operations. The quarterly report included an Engineering Assessment of the Programs for Maintenance of Building 23/23A, Building 54 and National Medical Cyclotron Plant Important to Safety, which is under ARPANSA review.

6.43 **Abnormal Occurrences, Incidents and Accidents**

ARPANSA received information on an abnormal occurrence in Building 54, which is under ARPANSA review.

6.44 **Responses to Previous Planned Inspection**

Responses to issues raised during a planned inspection at the National Medical Cyclotron in the March quarter were acceptable to ARPANSA. A number of items will be further confirmed by an inspection in due course.

ANSTO Environment

6.45 ARPANSA received a report in the quarter covering these matters:

- No abnormal occurrences, incidents or accidents occurred in relation to the facilities operated by Environment Division;
- There were no modifications to plant and procedures. However, the first stages of the replacement computer control system for the Australian National Tandem Accelerator for Applied Research (ANTARES) was tested. There was no change in safety and control features of the original system;
- No radioactivity was released to the environment;
- Five new operators of ANTARES were trained and accredited to operate the high voltage generator and two were approved to operate at least one ion source;
- Additional controlled access barriers were erected in areas of the ANTARES where ANSTO tours are conducted;
- Extra signage was displayed near the entrance of the ANTARES facility to define access conditions;
- A copy of the current Safety Assessment Committee Approval for all operations at ANTARES was completed, pending sign-off on final recommended changes;
- All major accelerator components, ion sources, high voltage generator and magnets of the Tandetron were installed and operational;
- High energy beamlines and diagnostic equipment of the Tandetron were installed;
- Mains power was connected to the Tandetron accelerator installation. An electrical grounding system was established to isolate the accelerator from the building ground. The split grounding system meets High Voltage Electrical Engineering's (HVVEE) requirements and satisfies Australian standards;
- The recorded level of radiation at the Tandetron facility at one metre surrounding the work area with a test beam of 2MeV protons was between background and

0.27 microsieverts per hour;

- The computer-controlled system of the Tandatron was completely installed and computer control available for all systems other than some of the accelerator mass spectrometry system;
- The Safety Analysis Report of the Tandatron progressed and awaited a radiation report prior to completion of the first stage.

ANSTO Materials Division – Actinide Suite

- 6.46 The quarterly compliance report addressing all licence conditions for the January-March quarter was received on 30 April. A number of the special licence conditions had been satisfactorily completed. There is further work required by the licence holder to address Operational Limits and Conditions for the facility.
- 6.47 The CEO approved a change to the Operational Limits and Conditions to increase the maximum mass of fissile material allowed in the facility.
- 6.48 ANSTO reported an abnormal occurrence that involved the loss of operation of the facility ventilation system due to an electrical fault. There was no risk of radiological contamination or radiological release. ANSTO has taken appropriate actions to minimise the risk of a similar occurrence.

ANSTO – Secondary Standards Dosimetry Laboratory

- 6.49 A report was received that indicated no significant changes to plant or personnel during the quarter.

Abnormal Occurrences at ANSTO's Nuclear Installations

- 6.50 ARPANSA is notified of all abnormal occurrences at ANSTO's nuclear installations but only includes in this report those classified as Level 1 or above on the International Nuclear Event Scale (INES) as all others are of no safety significance.
- 6.51 **HIFAR**
Regulatory officers reviewed an abnormal occurrence associated with a reactor trip due to human error and are assessing the incident report.

ANSTO Airborne Radioactive Discharges

- 6.52 The Regulatory Branch review of all airborne radioactive discharges reported by ANSTO for the period 1 April to 24 June show that the discharges remained less than the quarterly notification levels under the Licence authorisation. ARPANSA was informed of a four-weekly notification level for Xenon-133 being exceeded in one building. The radiation dose at 1.6 km from the HIFAR reactor from all airborne discharges for the quarter was less than one microsievert compared to the Discharge Authorisation dose objective of 20 microsieverts per year. ARPANSA concludes that ANSTO complied with the requirements of the Airborne Discharge Authorisation for the quarter.

ANSTO Liquid Radioactive Discharges

- 6.53 The Regulatory Branch review of ANSTO's reports of liquid radioactive discharges from the Lucas Heights Science and Technology Centre from 31 March to 30 June 2003 found that they complied with the Trade Waste Agreement of 15 July 2002 between Sydney Water and ANSTO, with all measured values at most a few per cent of the relevant limit.

ARPANSA - Melbourne

- 6.54 The report covering the last quarter addresses the following areas:
- 6.55 **Effective Control**
There was no change in effective control during the quarter. Both facilities (linear accelerator and teletherapy) are covered by a quality system consistent with ISO/IEC 17025. It is mentioned that as the Ionizing Radiation Section accreditation program proceeds, the documentation will be brought into line in accordance with the ARPANSA Quality Manual. The target completion date for the program is the end of 2004.
- 6.56 **Training, Accreditation and Authorisation**
The quarterly report mentions that criteria have been established and documentation is being updated with the quality system, which is scheduled to complete by September 2003.
- 6.57 **Safety Tests, Inspections and Reviews**
Procedures exist and documentation is being updated within the quality system and target date of completion is September 2003.
- 6.58 **Emergency Arrangements**
Emergency arrangements are in place and testing of interlocks is undertaken routinely. The development of suitable exercises for biennial review is in progress.
- 6.59 **Radiofrequency Exposure Levels**
The radiofrequency levels have been measured but no significant levels have been detected. The next date of review of radiofrequency exposure is scheduled in October 2003.

CSIRO

- 6.60 All source inventory information has now been updated and quarterly reporting is becoming routine for most divisions. As noted in previous reports, there is some inconsistency in the provision of reports from across the organisation. Proposed staffing changes in several divisions have the potential to exacerbate these problems in regulatory compliance. Specific items of note are summarised below.
- 6.61 **Heavy Ion Accelerator Facility**
A comprehensive quarterly report was received. This describes some alterations to

access arrangements for users of the beam. Work continued on examining options for remote operations. The recently acquired neutron detector indicated no neutron radiation at any time. Review of the operating manual is ongoing, the object of continuous improvement. Most staff attended a one-day safety course for users of sealed equipment emitting x-rays.

6.62 **Neutron Accelerator Facility**

A special licence condition requires review and updating of standard operating procedures by September 30. During the quarter, the facility Radiation Safety Officer provided a draft copy of a review and update for comment by the Regulatory Branch.

The quarterly report indicates that purchase of a deuterium-deuterium (DD) tube was completed. This yields 2.5 mega electron volt (MeV) neutrons at a flux 100 times lower than the 14 MeV neutrons of the existing deuterium-tritium (DT) tube. Construction of a Prototype Fast Neutron Radiography Scanner was completed.

6.63 **Land and Water**

Updated source inventory information and a quarterly report were received. A quantity of controlled material plus three controlled apparatus omitted from the original inventory were added. The quarterly report includes information that the Local Radiation Safety Rules for the Urrbrae site were updated in April. During the quarter a Basic Radiation Protection Course for users of unsealed radioactive substances was held at Urrbrae. In addition, the site Radiation Safety Officer passed a three-day refresher radiation safety course with credit. One higher than expected recorded dose was being investigated.

6.64 **Textile and Fibre Technology**

An update of source inventory information was received. Two calibration sources and three UV sources were added. Information was received indicating the intention to resume use of an x-ray diffraction apparatus. This commenced with the training of a potential operator. Formal notification under regulation 52 is anticipated.

6.65 **Corporate Property**

The quarterly report contains information on an inspection visit to the waste store by two CSIRO officers and the return to the store of four drums of material used in tests. Notification was received that environmental audit arrangements are being renegotiated. It is anticipated that the next external audit will take place before the end of October.

6.66 **Molecular Science**

The quarterly report and source inventory update confirmed that there was no new relevant information regarding source dealings in this division.

6.67 **Entomology**

An update of source inventory information and a quarterly report were received. These indicated no changes during the quarter.

- 6.68 **Sustainable Ecosystems**
A first update of source inventory information was received together with a comprehensive quarterly report. This includes information on personnel changes, including a new Acting Chief of division, as well as several amendments to source details.
- 6.69 **Marine Research**
There was no relevant change or alteration to the source inventory to report. On request, a formal letter was provided to the division confirming that prior approval from ARPANSA is not required for disposal of waste material containing radioactivity below the exemption level stated in the regulations.
- 6.70 **Plant Industry**
A first update of source inventory information was received. The move into a new building at St Lucia in February, together with closure of the laboratories at North Ryde, provided an opportunity to review and rationalise the source inventory. A number of redundant sealed sources await eventual safe disposal.
- 6.71 **Livestock Industries**
A first update of source inventory information was received. Some anomalies were identified, associated particularly with the closure of the Prospect site. Copies of detailed documentation relating to the Cobalt-60 gamma irradiator, including a sealed source certificate, were located. A special licence condition requiring the formal provision of this information to the CEO remains outstanding.
- 6.72 **Food Science Australia**
An update of source inventory information and a quarterly report were received. The quarterly report indicates that the division is currently without a qualified Radiation Safety Officer.
- 6.73 **Energy Technology**
The updated source inventory includes details of some additional unsealed sources used for tracer studies at Lucas Heights. Notification was received of a change of Radiation Safety Officer.
- 6.74 **Petroleum Resources**
The update of source inventory information includes one additional laser installation. Notification of a new Chief of Division was received.
- 6.75 **Health Sciences and Nutrition**
An update of source inventory information and a quarterly report were received. These include detail changes to the inventory and information on radiation safety training.
- 6.76 **Forestry and Forest Products**
A notification of delay was received with regard to update of source inventory information.

6.77 **Atmospheric Research**

An update of source inventory information and a quarterly report were received. These indicate no changes during the quarter. Construction of a possible Class 3B laser for a special project is in the planning stage.

6.78 **Exploration and Mining**

A copy of an annual report was received early in the quarter. This refers to changes to CSIRO safety management arrangements whereby each division now has a Health, Safety and Environment Manager as well as local safety officers. A review of training requirements identifies specific training needs, many of which have already been addressed. Assessments of the results of environmental monitoring around radiation stores and of recorded personal doses are also provided. The report also comments on a review of security.

There have been a number of media reports regarding proposed closure of the division's North Ryde site. Formal notification is awaited of any changes to arrangements regarding controlled apparatus and controlled material.

6.79 **Minerals**

An update of source inventory information and a comprehensive quarterly report were received. There are a number of minor amendments to the source inventory. Notification was received of an incident involving a major water leak from the cooling system of a controlled apparatus. The incident was of no radiological significance but was reported to Comcare as a dangerous occurrence because of the associated electrical hazard.

6.80 **Manufacturing and Infrastructure Technology**

A report for the March quarter was received in April. This indicates no additional issues of note at any of the six sites where controlled sources are held. As first notified in December, modifications were being made to x-ray diffraction apparatus at the Highbury site to upgrade interlock arrangements. The June report indicates that these improvements have now been completed. A first update of source inventory information was received and some detail changes were noted.

6.81 **Telecommunications and Industrial Physics**

A notification of delay was received with regard to update of source inventory information. Continuing follow-up of the laser eye-strike incident notified last November confirms retinal damage to one individual consistent with the reported incident. The incident has accelerated the introduction of routine eye examinations. Initial results of those undertaken so far indicate possible UV overexposure in two individuals.

Office of the Supervising Scientist

6.82 A quarterly update of source information was outstanding. Notification of delay was received.

Australian Institute of Marine Science

- 6.83 A quarterly update of source information indicated minor modification to the inventory of unsealed sources plus the operation of a mobile x-ray apparatus aboard the institute's vessel. This unit has now been returned overseas.

Australian Antarctic Division

- 6.84 A quarterly update of source information is outstanding. Notification of delay was received together with preliminary information regarding additional unsealed and laser sources and one new kind of x-ray apparatus. A quarterly update of source information is outstanding. Notification of delay was received together with preliminary information regarding additional unsealed and laser sources and one new kind of x-ray apparatus.

Australian Customs Service

- 6.85 **Fisherman Island Container Examination Facility**
Customs continued to operate the Container Examination Facility at Fisherman Island.
- 6.86 **West Melbourne Container Examination Facility**
Customs continued to operate the Container Examination Facility at West Melbourne. A safety analysis report for operation of the facility was updated to include the results of commissioning, consistent with special licence conditions.
- 6.87 **Matraville Container Examination Facility**
Customs continued to operate the Container Examination Facility at Matraville. A safety analysis report for operation of the facility was updated to include the results of commissioning, consistent with special licence conditions. An amended source inventory was received indicating continuing expansion in the use of x-ray inspection sources.

Australian Quarantine Inspection Service

- 6.88 An update of source inventory information was received. This included information on six additional mobile x-ray units.

Parks Australia North

- 6.89 A comprehensive quarterly report was received. This included information on the provision to various State and Commonwealth government departments of a final draft of the first part of the rehabilitation plan, a desk-top review of potential containment sites and consideration of monument options for existing containments.

Australian National University

- 6.90 The university's action plan is well on track for timely compliance with conditions

of source licence S0027. Officers of the Regulatory Branch were provided with a copy of the newly prepared ANU Audit Checklist for radiation hazards.

The licence holder reported during the quarter that:

- there were no abnormal radiation occurrences;
- there were no significant modifications to controlled apparatus and procedures;
- radioactive releases from laboratories were in accordance with national codes of practice and plans and arrangements as described in the original licence application; and
- changes to source inventories were minor. An updated source inventory for 8 schools, 2 faculties and 1 department was included.

Department of Defence

6.91 A Defence compliance meeting was held at ARPANSA's Miranda offices. Two Officers from ARPANSA and two Officers from Defence attended. Topics discussed included maintenance of source licence S0042 and the Defence Source Inventory, inspection protocols and timetables, and the progression of Defence Facility licence applications.

6.92 **Source Licence**

Defence continued with efforts to comply with the special licence conditions attached to the Defence source licence S0042. These special licence conditions are of a prescriptive nature, and Defence reported that although the prescriptive elements are yet to be finalised, the overall policy structure has been implemented and this will allow the prescriptive details to be addressed in the foreseeable future. Defence submitted an updated inventory of controlled material and controlled apparatus, a number of which have been selected for audit by ARPANSA officers.

6.93 **Facility Licences**

Defence continues to comply with the special licence conditions attached to the facility licences for Salisbury and Maribyrnong. Assessment of the licence applications for the remaining four prescribed radiation facilities is progressing, with Defence yet to provide sufficient additional information to allow a licensing decision to be made. This information is expected in the foreseeable future.

7. International Liaison

7.1 Geoff Williams attended a technical meeting on the safety assessment for predisposal radioactive waste management facilities of the IAEA in Vienna May 26-30.

7.2 Stephen Solomon attended a meeting of the IAEA National Competent Authorities for radiological emergencies and a two day training workshop on radiological emergencies in Vienna from May 29 to June 6.

- 7.3 Stuart Woollett attended an IAEA Joint Working Party Meeting of the Application of Safety Assessment Methodologies Program in Vienna, June 2-6.
- 7.4 David Webb attended the biennial meeting of the Consultative Committee for Ionizing Radiation in Paris in late May and presented three papers. Issues in radiation dosimetry; the progress of key and supplementary comparison programs; and the development of calibration capabilities through the Mutual Recognition Arrangement (MRA) were reviewed.
- 7.5 A Regulatory Branch officer attended the IAEA Technical Meeting on Development of High Density U-Mo Dispersion Fuels in Vienna, June 23-25.
- 7.6 Peter Colgan travelled to Bombay, May 11-20, as part of an IAEA faculty team conducting a Regional Training Course on the Security of Nuclear Installations. He provided lectures on the safety and security of radioactive sources, with particular emphasis on the security assessment of radioactive sources used within Australia for education, research, medicine and industry purposes, and their application to radioactive sources used in the Indian sub-continent.
- 7.7 Peter Colgan travelled to Panama City, June 9-20, as part of an IAEA team undertaking a Transport Safety Appraisal Service (TranSAS) mission. The purpose of the mission was to evaluate the regulatory infrastructure and implementation provisions dealing with the safety of the transport of radioactive material within and through the country. An IAEA TranSAS report on the findings is expected to be published in early 2004.
- 7.8 Colin Roy visited the WHO in Geneva, June 2-13. Activities included continued work on the review of retrieved papers on static fields, preparation of detailed tables and the drafting of summary text (part of the Health Risk Assessment being conducted by WHO for static fields). During this period the WHO International EMF Project held three meetings, namely the International Advisory Committee, review of the Research Agenda and a meeting of the Research Coordination Committee.

John Loy
CEO
September 24, 2003