



AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY

QUARTERLY REPORT
OF THE
CHIEF EXECUTIVE OFFICER
OF ARPANSA
FOR THE PERIOD 1 JANUARY TO 31 MARCH 2003



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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.

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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 release of the draft National Directory for Radiation Protection as a discussion paper during December 2002 and January 2003, 27 submissions were received. The National Uniformity Implementation Panel (Radiation Control) considered the comments at its meeting on 20 March, particularly with regard to the exemption levels proposed in the draft National Directory. Further drafting is to proceed.

National Competition Policy Review of Radiation Protection Legislation

1.2 Expressions of interest for consultants to carry out three of the 12 projects were invited in February. The National Uniformity Implementation Panel (Radiation Control) reviewed the progress of remaining projects at its meeting in March.

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 began in February. Desk-top site surveys for the construction of radionuclide sampling stations at Macquarie Island and Mawson were accepted by the CTBTO. There was further progress on documentation to establish a quality system for the Australian

Radionuclide Laboratory, at ARPANSA, during the quarter.

Nuclear powered warships

- 2.2 ARPANSA staff participated in Visiting Ships Panel (Nuclear) Technical Working Group port validations for Darwin, Freemantle (Gages Road) and Garden Island (HMAS Stirling) during the quarter.

Conferences, meetings and technical advice

Non-Ionizing Radiation Branch

- 2.3 A working group of the Radiation Health Committee was formed to revise the Radiation Health Standard 37 *Code of practice for the safe use of lasers in the entertainment industry (1995)*. An initial meeting was held on 27 February.
- 2.4 Work continued on the Regulatory Impact Statement (RIS) for the draft ARPANSA Occupational Ultraviolet Radiation (UVR) Exposures Standard, including the addition of statistical information on the number of workers affected by the proposed standard.
- 2.5 A paper co-written by Peter Gies titled *Progress in CIE TC 6-29 – UV Protection and Clothing* was completed during the quarter and submitted for inclusion in the June-July meeting of the International Commission on Illumination in San Diego, United States.
- 2.6 A paper by Peter Gies titled *The effective use of sunscreens* appeared in the January issue of the Cancer Society New Zealand publication – Cancer Update in Practice.
- 2.7 A paper with contributions from Peter Gies, Colin Roy and Alan McLennan of the Branch titled *Ultraviolet Protection Factors for Clothing: An Intercomparison of Measurement Systems* was published in the journal Photochemistry Photobiology, 77, 58-67.
- 2.8 As a member of ICNIRP's Standing Committee III, Colin Roy produced the ICNIRP Statement appearing in Health Physics (2003) 84, 383-387, titled *Guidance on determining compliance of exposure to pulsed and complex non-sinusoidal waveforms below 100 kHz with ICNIRP Guidelines*.
- 2.9 Lastly, a paper by Peter Gies titled *Australia has more than enough solar radiation* was published in Clinical and Experimental Optometry, 86, 71-73.

Medical Radiation Branch

- 2.10 In February, the calibration and measurement capabilities of seven countries in the Asia-Pacific Metrology Program (APMP), including those of ARPANSA, were submitted for Australia's entry into Appendix C of the Mutual Recognition Arrangement (MRA).
- 2.11 As chair of the APMP Technical Committee for Ionizing Radiation, David Webb

attended a meeting of all Technical Committee chairs at the Advanced Institute for Science and Technology in Tsukuba, Japan, March 24-25. This was the first meeting of its kind held by the APMP and the purpose was to discuss programs required for the MRA and the problems that were being encountered.

- 2.12 David Tingey attended the national conference of the Australian Institute of Radiography 2003 in Sydney to promote the national survey on radiation doses from general diagnostic radiology and presented a poster on the research methodology and progress.

Regulatory Branch

- 2.13 Four officers attended various sessions of the ninth meeting of the International Group on Research Reactors held during March in Sydney. The conference covered operations, utilisation, safety and regulation of research reactors around the world.
- 2.14 Two officers attended a meeting of the Australian Nuclear Science and Technology (ANSTO) Emergency Management Arrangements Public Information Working Party. This was to review a community information document titled *Overview of arrangements for emergencies originating at ANSTO's Lucas Heights site*. Sutherland Shire Council subsequently issued the revised document.
- 2.15 One staff member delivered a presentation at the Defence Ionizing Radiation Protection Officer course held on 26 February.

Public communication activities

- 2.16 Non-Ionizing Radiation Branch continued to provide information to members of the public regarding electromagnetic energy (EME) and health. Requests for information about the possible effects of exposure to fields originating from powerlines and mobile telephony dominated again.
- 2.17 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 is envisaged they will be publicly available shortly.
- 2.18 Michael Bangay participated in three mobile phone Base Station Community Consultation Meetings at Oatley in Sydney. In addition, he gave four presentations at the launch of the Australian Communications Industry Forum in Perth, Brisbane, Adelaide and Melbourne.
- 2.19 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, UVR exposure, ANSTO's operations at Lucas Heights and x-rays on pregnant women.
- 2.20 Visitors to the ARPANSA website who download a single file are logged as a single

hit. ARPANSA's site received a total of 93,382 successful 'hits' in the quarter.

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

Non-ionizing radiation

- 3.1 Due to a lack of contributions from industry sources, the proposed national survey of residential magnetic field exposure reported previously will not proceed. However, a state study may be a viable alternative. Non-Ionizing Radiation Branch staff began preparing such a proposal for Victoria.
- 3.2 An intercomparison of UVR detectors and their calibrations commenced with the University of Southern Queensland at Toowoomba as part of World Health Organisation/World Meteorological Organisation (WHO/WMO) recommendations for standardising solar UVR measurements.
- 3.3 ARPANSA in conjunction with Tandou Ltd, which has a range of agricultural and horticultural business ventures in three different states (Victoria, New South Wales and South Australia), began a study of the UVR exposures of the company's outdoor workers. Such a study with the types of workers involved has not been done before.

Medical radiation

- 3.4 The Medical Physics Section continued to progress its national survey on radiation doses from general diagnostic radiology. The survey moved into the dose measurement phase.
- 3.5 The Medical Physics Section also began a limited survey, in Sydney, to estimate the scale of radiation doses and risks resulting from radiation exposures outside x-ray image receptors. When acquiring an x-ray image, a radiographer uses their professional judgement and experience to match the x-ray field size to that of the x-ray film. Generally the x-ray field is set so that it is marginally bigger than the film or image receptor. The part of the x-ray field outside the image receptor is 'wasted' exposure in so far as it contributes to patient radiation dose but nothing to the x-ray image.
- 3.6 The first full round of the national therapy quality assurance dosimetry audit started. Letters and quotes were sent in January and February to Australian radiotherapy centres, inviting them to participate in the first or subsequent batches. Each centre in the first batch of five centres was sent a thermo-luminescent dosimetry kit.
- 3.7 Elite sportspeople such as AFL footballers and professional gymnasts experience many injuries in the course of their work. To accelerate recovery, these athletes often experience many more radiological and nuclear medicine procedures than non-athletes. The Medical Physics Section, in collaboration with a former medical practitioner for the Australian Institute of Sport, studied the nature and magnitude of radiation doses and risks faced by these individuals. The resulting paper for

publication in the Clinical Journal of Sport Medicine neared completion.

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

Calibration services

- 4.1 The Non-ionizing Radiation Branch Radiofrequency Calibration Laboratory calibrated 54 monitors, 47 probes, nine personal dosimeters and three other devices. Extensive improvements were made in both quality assurance and efficiency of procedures associated with these services. For example, independent automated quality checking software was commissioned in February, replacing the time-consuming manual checks and calculations that were previously performed on a weekly basis.
- 4.2 UVR calibrations of a research spectroradiometer were conducted for the Monash University School of Biological Sciences.
- 4.3 Medical Radiation Branch's Ionizing Radiation Standards (IRS) Section dosimetry calibration service for external clients commenced three therapy calibrations and completed four others. IRS Section began one protection level calibration and completed two others.

Fabric testing and labelling

- 4.4 There was continued demand for fabric Ultraviolet Protection Factor (UPF) testing, licensing and labelling during the quarter. 74 jobs were received that involved the testing of 274 fabric samples. In addition, 21 UPF trademark licences were completed and 577,000 UPF swing tags were issued. 21 pairs of sunglasses were tested for their UVR protection properties.

UVR data and hazard assessments

- 4.5 Scientific consultation and data on solar UVR levels worldwide was provided to the Cancer Foundation of Victoria, Ampelite Australia and Promark Japan.
- 4.6 Two industrial UVR hazard assessments commenced; one on UVR hazards in a printing company, the other on UVR hazards from transilluminators.
- 4.7 Staff tested the UVR protection of windscreen/automobile portable tint patches intended to assist fundraising for a British registered charity, Global Cancer Care.
- 4.8 Emissions from a new phototherapy cabinet for Australian UV Services were measured. This is part of an ongoing study to determine the exposure levels of patients.

QA program for radiopharmaceutical products

- 4.9 The quality assurance program for radiopharmaceutical products used by hospital

nuclear medicine departments found that the radionuclidic content of two batches was outside specification. One was just below specification and the other was greater. The former case was brought to the attention of the manufacturer.

Surveillance of effluent discharges at ANSTO's HIFAR reactor

- 4.10 Routine independent verification of the radioactivity of emissions from the High Flux Australian Research (HIFAR) reactor at Lucas Heights continued. In March, samples of liquid effluent discharges and filters used to monitor gaseous discharges were received and measured by Environmental and Radiation Health Branch for radioactivity.

Measurement of radioactivity in drinking water

- 4.11 Testing the radioactivity of drinking water, and other water samples, was carried out on a commercial basis for water authorities and other agencies around Australia. Environmental and Radiation Health Branch tested 303 samples during the quarter against requirements of the Australian Drinking Water Guidelines.

Certification of radioactivity in exported foodstuffs

- 4.12 Measurements of the radioactivity of foodstuffs destined for export was conducted on request and Environmental and Radiation Health Branch issued 16 Radioactivity Certificates for shipments of exported foodstuffs.

Linear accelerator irradiation

- 4.13 The IRS Section provided linear accelerator high dose irradiation services to the Australian National University to study defects in diamond chips used for therapy dosimetry. Electron fluences up to $10^{19}/\text{cm}^2$ were achieved. The Australian Institute of Nuclear Science and Engineering used the pulse radiolysis facility for a collaborative study between Melbourne University and the University of Erlangen, Germany.

5. Council and Committee Operations

Radiation Health and Safety Advisory Council

- 5.1 The Council did not meet during the quarter. Summaries of previous meetings are available at this web address: <http://www.health.gov.au/arpansa/rhsac.htm>.

Radiation Health Committee

- 5.2 The Committee met on 19-20 March in Yallambie. A summary of the meeting is available at <http://www.arpansa.gov.au/rhc.htm>.

Nuclear Safety Committee

- 5.3 The Committee met on 21 February in Sydney. This was the first meeting of the

second triennium Committee. A summary of the meeting is available at <http://www.arpansa.gov.au/nsc.htm>.

Radiation Protection Series publication program

- 5.4 28 public submissions were received following release of the draft *Recommendations for Intervention in Emergency Situations Involving Radiation Exposure* for public comment from early December 2002 until late February 2003. The main issues were discussed at the March meeting of the Radiation Health Committee. The subsequent guidance given to the working group developing the draft *Recommendations* was also provided to the groups and individuals who made submissions and can be found at this URL: http://www.arpansa.gov.au/rhc_mt.htm.
- 5.5 The Radiation Health Committee working group will proceed to review the draft document in light of comments received from the public and the Committee itself. The revised draft *Recommendations* will be released for a further round of public comment when an associated technical report on the risks of radioiodine exposure and protective measures is completed.

6. Regulation

Licensing

Licence Applications

- 6.1 Two source licence applications were received as follows:
- Australia Post for mobile cabinet x-ray equipment; and
 - Australian Protective Service for x-ray machines.
- 6.2 Three facility licence applications were received as follows:
- Australian Customs Service to operate a controlled facility, namely a shipping container examination facility at Matraville, Sydney;
 - Australian Customs Service to operate another controlled facility, namely a shipping container examination facility at Fisherman's Island, Brisbane; and
 - An application from ANSTO to operate a 2MV accelerator.

Application Assessment and Licence Issuance

- 6.3 Regulatory assessment of applications and, in some cases, existing licences resulted in the CEO of ARPANSA making the following licensing decisions:
- 6.4 Amended source licences were issued to:
- Australian Institute of Marine Science to include additional non-ionizing sources and to possess and use veterinary x-ray equipment;
 - ANSTO Environment, authorising new work involving radiotracers;
 - CSIRO Energy technology Division, that included the addition of sources and the reclassification of equipment;

- CSIRO Exploration and Mining, that included an additional Class IV laser source as part of the source inventory.

6.5 These facility licences were issued:

- Australian Customs Service to operate a controlled facility, namely a shipping container facility at Matraville, Sydney;
- Australian Customs Service to operate another controlled facility, namely a shipping container examination facility at Fisherman's Island, Brisbane;
- ANSTO Environment to operate a controlled facility, its Australian National Tandem Accelerator for Applied Research (ANTARES);
- Australian Defence Force and Department of Defence to possess and control the prescribed radiation facility, a closed neutron generator at Maribyrnong, Victoria.

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

6.6 The Regulatory Branch issued 71 Customs Prohibited Release permits for the importation of non-medical radioisotopes. The Radiopharmaceutical Section issued 93 Customs Prohibited Release permits for the importation of medical radioisotopes.

ANSTO Materials Division – Fabrication Bay

6.7 A review of the safety analysis report for the facility was completed during the quarter.

ANSTO Environment Division – 2MV Tandetron

6.8 The Regulatory Assessment Report for operating a prescribed radiation facility of ANSTO Environment, namely the 2MV Tandetron, was being prepared.

ANSTO Physics Division

6.9 Three Regulatory Branch officers attended a meeting to discuss the transfer of effective control of various sources held by the former Physics Division to other Divisions, as well as progress on licensing of an irradiator. ARPANSA received some requested additional information on this facility and the schedule for providing the remaining additional information.

Monitoring compliance under the ARPANS Act

ANSTO - Replacement Research Reactor Site Licence

6.10 The 14th 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

6.11 ANSTO submitted 12 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 five that were submitted earlier.

- 6.12 For one of the RFAs submitted during the quarter, the Reactor Control and Monitoring System (RCMS), ARPANSA was unable to grant construction approval because all information required by ARPANSA for that decision would not be available until some hardware is procured, software is installed and the system is subjected to factory integration tests. Accordingly, the CEO of ARPANSA granted approval for procurement and manufacture of the RCMS up to and including the factory integration testing.
- 6.13 ARPANSA imposed additional licence conditions under Section 36(2)(a) of the ARPANS Act during the quarter in relation to the Safety Category and minimum mission time for an individual redundancy of the Standby Power Supply diesel generators.
- 6.14 The ARPANSA review of the Cold Neutron Source Preliminary Safety Assessment Report was in progress in the quarter. ARPANSA also reviewed the responses to a number of questions asked of ANSTO.

ANSTO HIFAR Reactor Operations

- 6.15 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 January and March. Ten new projects were identified and all but two were assigned a safety classification. 19 projects were in progress, while a further three had reached practical completion and two had reached final completion.
- 6.16 The 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.
- 6.17 ARPANSA received an ANSTO proposal to change the operational safety limit relating to surface heat flux of irradiation rigs in the HIFAR reactor. Regulatory officers began performing the assessment.
- 6.18 ARPANSA began reviewing an ANSTO proposal to amend a condition relating to plant staffing.
- 6.19 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. Staff undertook a routine audit of the HIFAR Control Room Logbook.

ANSTO - Inspections

- 6.20 ARPANSA's policy on regulatory inspections was formally promulgated by the CEO in March. A supporting Regulatory Branch procedure was issued at the same

time. Both documents are on the ARPANSA website at <http://www.arpansa.gov.au/inspect.htm>.

- 6.21 Two Regulatory Branch officers attended a meeting to discuss licensing issues regarding the Ore Processing Facility. The officers visited the relevant units of this facility to obtain information on various processes and systems.
- 6.23 Two Regulatory Branch officers attended a meeting to discuss the issues relating to modifications to a building for waste treatment and conditioning. This item is also discussed under 'Modifications' of ANSTO Waste Operations and Technology Development.
- 6.24 A planned inspection was carried out at the National Medical Cyclotron operated by ANSTO at Camperdown. A final inspection report was prepared and issued by Regulatory Branch.

ANSTO – Moata Research Reactor

- 6.25 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 Moata;
 - No modifications or changes were initiated during the quarter; and
 - No reactivity was released to the environment.
- 6.26 Moata has satisfied all of the requirements that were required under the Special Licence Condition stipulated in the Licence granted by the CEO of ARPANSA on 18 May 2001. Requirements stipulated under the Standard Licence Conditions will be examined under the licensed facility inspection program.

ANSTO – Fuel Operations

- 6.27 ARPANSA received a quarterly report on compliance with licence conditions.
- 6.28 Progress in satisfying Special Licence Condition 3.7(e) in the Facility Licence reached the point where ANSTO started manufacturing the secondary containers for fissile powders.
- 6.29 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 spent fuel storage pond caused by the fuel cropping incident in March 2002.
- 6.30 The internal ANSTO review of the Safety Analysis Report for the spent fuel storage pond was completed and will be issued in the next quarter. Work was continued in the quarter by ANSTO on the Safety Analysis Reports for other fuel operations facilities.

There are two boreholes for monitoring ground water close to Building 23 that

contains fuel storage and handling ponds, in compliance with a Special Licence Condition. No samples of borewater were taken during this quarter as the samples were taken during the previous quarter and the results for alpha, beta and gamma were all low, comparable to other background values around the Lucas Heights Science and Technology Centre. New samples are planned by ANSTO to be taken in the June quarter.

ANSTO Physics Division

6.31 Physics Division of ANSTO ceased on 1 December 2002 and its facilities and sources, which are the subject of ARPANSA licenses or licence applications, were transferred to other ANSTO divisions. These changes have affected the responsibilities associated with the licences of divisions to which the sources and facilities were transferred as specified in the table below:

Current Division Nomenclature	Future Nomenclature	Sources or Facility Transferred from Physics Division
Physics	Discontinued from 1/12/2002	
Safety	Safety and Radiation Science	Radiation technology and standards (excluding the Gamma Technology Research Irradiator (GATRI)) and electronic systems support groups
Environment	Name to be determined	Accelerator applications, accelerator mass spectrometry, analytical mass spectrometry chemistry and accelerator operations groups
New Division	Bragg Institute	Neutron scattering, neutron scientific operations, neutron scattering technical support and synchrotron radiation groups
Radiopharmaceuticals	No Change	GATRI
Nuclear Technology	No Change	MOATA

ANSTO Waste Operations and Technology Development

6.32 ANSTO Waste Operations and Technology Development is licensed as a nuclear installation and, under the licence, ANSTO Nuclear Technology is required to submit a quarterly report to the CEO of ARPANSA. ARPANSA received such a report addressing the following areas:

Modifications

Building 20B is being extended for conditioning and packaging of radioactive wastes. Two ARPANSA Officers visited this facility to obtain general information

about the facility. ARPANSA advised ANSTO that the proposed modification required the prior approval of CEO of ARPANSA under Regulation 51.

Airborne Discharge

The four-weekly notification level of tritium from a stack occurred as a consequence of the planned processing of the HIFAR ion exchange column. ARPANSA was notified about this release and the matter is considered separately under airborne discharges below.

Liquid Discharge

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 liquid discharges below.

Inventories

The quarterly report lists all changes in stored inventories. ANSTO reported that the updating of a number of the inventory categories is not completed for this quarter, but will be rectified in the June quarter.

ANSTO Radiopharmaceuticals and Industrials

6.33 ANSTO Radiopharmaceuticals and Industrials (ARI) are licensed to operate four nuclear installations and three prescribed facilities under a single licence (F0044-5A, 5B, 5C). In addition a prescribed radiation facility, namely GATRI, is under the effective control of ARI and this facility is operated under a separate licence (FV0044-6C). Under the licence conditions ARI is required to submit quarterly report to the CEO of ARPANSA. ARPANSA received the report for the last quarter. This quarterly report addresses the following areas:

Modifications

- Swipe card entry system was installed on the GATRI irradiator that previously did not have such a system.
- The CEO of ARPANSA approved a submission detailing the construction and commissioning of a ventilation upgrade to a production building.
- A master plan for the development of the production and quality control facilities in a production building was being developed in anticipation of a submission to ARPANSA.

Effective Control

- A special licence condition requires ANSTO to maintain a current inventory of all controlled radioactive materials and controlled apparatus. The ARI quarterly report mentioned that the data base for maintaining the inventory was in the process of being upgraded and the upgrade will be completed in mid-2003.

Safety Management Plan

- A special licence condition requires formal accreditation of facility operators. The ARI quarterly report mentioned that accreditation of operators in relation to

radiation safety was continuing. Details of these courses were submitted to ARPANSA and it is anticipated that all operators will complete the accreditation by June 2003.

ANSTO Environment

6.34 ANSTO Environment is licensed to operate a 3MV Van de Graaff Accelerator and the ANTARES as prescribed radiation facilities. ANSTO Environment is also licensed to site and construct a 2MV Tandem Accelerator (Tandetron), under Facility Licence F0134. ARPANSA received a quarterly report that indicated:

- No abnormal occurrences, incidents or accidents occurred in relation to these facilities.
- There were no modifications to plant or procedures.
- A routine replacement of the accelerator's charging belt was performed at the 3 MV Van de Graaff Accelerator.
- No radioactivity was released to the environment.
- Preparation of the ANSTO Safety Analysis Report for the Tandetron had begun.
- Equipment assembly for the Tandetron was on schedule.
- Electrical installations at the Tandetron will be in accordance with Australian Standards.
- The high voltage generator, duoplasmatron ion source, sputter ion source and recombinator elements were installed and individually tested for functionality at the Tandetron.

ANSTO Materials Division – Actinide Suite

6.35 ANSTO provided a plan and schedule for addressing the special licence conditions for the facility. The plan and schedule has been reviewed by ARPANSA Regulatory Branch officers and is considered to be appropriate. The quarterly compliance report addressing all licence conditions has not yet been received from Materials Division.

Abnormal Occurrences at ANSTO's Nuclear Installations

6.36 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. There were no abnormal occurrences, classified as INES Level 1 or above, at any of the nuclear installations notified by ANSTO in this quarter. Nonetheless, regulatory officers began reviewing a HIFAR reactor operational occurrence that might be classified as an abnormal occurrence following review.

ANSTO Airborne Radioactive Discharges

6.37 The Regulatory Branch review of all airborne radioactive discharges reported by

ANSTO for the period 29 December 2002 to 1 April 2003 showed that these remained less than the quarterly notification levels under the licence authorisation. ARPANSA was informed of a four-weekly notification level for tritium being exceeded in one building due to the processing of an ion exchange column. The radiation dose at 1.6km from the HIFAR reactor of all airborne discharges for the quarter was less than one micro-sievert compared to the Discharge Authorisation dose objective of 20 micro-sieverts per year. ARPANSA concludes that ANSTO complied with the requirements of the Airborne Discharge Authorisation for the quarter.

ANSTO Liquid Radioactive Discharges

- 6.38 The Regulatory Branch review of ANSTO's reports of liquid radioactive discharges from the Lucas Heights Science and Technology Centre from 1 January to 31 March found that they complied with the Trade Waste Agreement of 31 May 2001 between Sydney Water and ANSTO. All measured values were at most a few per cent of the relevant limit.

ARPANSA - Melbourne

- 6.39 The Medical Radiation Branch of ARPANSA at Yallambie in Melbourne is licensed to operate a linear accelerator and teletherapy facility as prescribed radiation facilities. The licence holder submitted a quarterly report to the CEO of ARPANSA, as required under the licence.
- 6.40 There was no change in effective control of the ARPANSA linear accelerator and the teletherapy facility during this quarter. Both facilities are covered by a quality system consistent with ISO/IEC 17025.
- 6.41 The quarterly report mentioned that criteria were established for training, accreditation and authorisation of operators and documentation is being updated with the quality system. Similarly, procedures for safety tests, inspections and reviews exist and documentation is being updated with the quality system. There was no notifiable alteration to either of the facilities during the quarter. Emergency arrangements are in place and testing of interlocks is undertaken routinely. Radiofrequency levels were measured but no significant levels were detected.

CSIRO

- 6.42 As noted in the report for last quarter, a review of compliance with licence conditions indicated some inconsistency across the organisation. Useable source inventory information has now been provided to all divisions. A brief outline of the response of each division or facility is provided below:

Heavy Ion Analytical Facility (HIAF)

Anticipated maintenance items identified in the March quarterly report for the facility include:

- construction of an interlocked barrier to prevent access to restricted areas; and
- installation of lockable access to the accelerator for maintenance and start-up.

In compliance with a special condition of licence, HIAF management conducted a review of standard operating procedures. The above maintenance measures are

being introduced as a consequence of ARPANSA's response to this review.

Neutron Accelerator Facility

A change of Nominee was notified in the quarterly report for this facility. It is also of note that a replacement Deuterium-Tritium tube was obtained. Purchase of a Deuterium-Deuterium tube was being considered.

Land and Water

Baseline source inventory information was sent on 11 February. A notification of delay was received with regard to update of this information.

Textile and Fibre Technology

An update of source inventory information and a quarterly report was received. These indicate no changes during the quarter. A large ultra violet source remains mothballed and is unlikely to be required for the next six months. Under the terms of the source licence a survey of the radiation output of this source must be undertaken before it is recommissioned.

Corporate Property

A copy of an environmental audit report dated September 1998 was provided to the CEO. This was in response to a special licence condition requiring the provision, by 31 May 2002, of copies of annual environmental audit reports for 1998 to 2001.

A quantity of radioactive materials from the stockpile of contaminated soils was returned to Woomera after completion of analytical testing (see Exploration and Mining report).

Molecular Science

An update of source inventory information and a quarterly report was received. The division has relocated to new premises on the same site at North Ryde. A complete review of sources held at North Ryde and at Clayton has been undertaken.

Entomology

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

Sustainable Ecosystems

Baseline source inventory information was sent on 3 February. Update of this information was still outstanding at the end of the quarter.

Marine Research

The division has a replacement OHS Manager. A review of sources was being undertaken and a number of additional sources were added to the inventory. One item of controlled apparatus was registered incorrectly and an amendment to the licence document will be required.

Plant Industry

Baseline source inventory information was sent on 11 February. A notification of delay was received with regard to update of this information. Follow up of an

abnormal personal dose recorded in the report for the previous quarter indicated that this was not indicative of any trend. It was probably attributable solely to the increased volume of radiation work at that particular time.

Livestock Industries

Baseline source inventory information was sent on 1 January. Update of this information and copies of sealed source certificates were outstanding.

During the past several months there were a number of discussions with the Radiation Safety Officer at the Australian Animal Health Laboratories. These concerned a special licence condition requiring results of a review of the operation of their gamma irradiator be provided to the CEO by 31 March 2002. ARPANSA has subsequently been notified by the Nominee of the decision to decommission the irradiator and request its reclassification.

Food Science Australia

An update of source inventory information and a quarterly report was received. The division has relocated to new premises on the same site at North Ryde. A complete review of sources held at North Ryde has been undertaken.

Energy Technology

A report was received for this quarter indicating no change to the source inventory or arrangements for dealing with controlled sources. The report for the previous quarter included results of a comprehensive review of plans and arrangements across all sites. A copy of a safety improvement plan was included. No specifically radiological issues were identified in the plan.

ARPANSA was notified of an incident at the Lucas Heights Research Centre involving contamination of a waste skip with Cobalt-60. A final report is awaited but interim information suggests that an employee of another organisation used a contaminated container to transfer inactive waste material from a drain into the skip.

Petroleum Resources

An update of source inventory information and a quarterly report was received. These indicate no changes during the quarter. A recently acquired Class 4 Nd-YAG laser system is now fully operational, including necessary safety controls and operating procedures.

Health Sciences and Nutrition

An update of source inventory information and a quarterly report was received. The activity of one sealed source was re-estimated and the inventory amended accordingly. A change of Nominee was notified.

Forestry and Forest Products

A notification of delay was received with regard to update of source inventory information.

Notification was also received of a fire in a vehicle trailer containing a sealed source

neutron moisture meter and other equipment, including gas cylinders. This occurred in a city area. The fire was extinguished without significant damage and with no radiological consequences.

Atmospheric Research

An update of source inventory information and a quarterly report was received. These indicate no changes during the quarter. Clarification on some technical matters regarding laser operations is still being pursued.

Exploration and Mining

The update of source inventory information indicated no new acquisitions. A quantity of radioactive materials from the stockpile of contaminated soils, held by CSIRO at Woomera under licence S0013 was returned to Woomera.

Minerals

An update of source inventory information and a comprehensive quarterly report was received. There were a number of minor additions to the source inventory plus the acquisition of two Group 2 sealed sources of Cobalt-60 (822 MBq and 3277 MBq). Additional unsealed Carbon-14 sources were transferred to the waste store at Clayton. A change to the Nominee was also notified.

Manufacturing and Infrastructure Technology

Baseline source inventory information was sent on 30 January. Update of this information was outstanding.

Telecommunications and Industrial Physics

An update of source inventory information identified a number of additional controlled sources of non-ionising radiation for inclusion. ARPANSA was notified of an incident last November involving an ‘eye-strike’ by a laser. An inspection was undertaken in response. This identified a number of recommendations for improvement, confirming the conclusions and recommendations in the incident report from the laser safety officer.

Australian Institute of Marine Science

- 6.43 ARPANSA received updated source inventory information and a quarterly report from the Institute. A new Occupational Health and Safety Manager was appointed and undertook a three-day training course in radiation safety. Minor amendments were made to the source inventory.

Australian Antarctic Division

- 6.44 A warning system was installed at the Davis camp to alert communications operators and pilots to the operation of the laser used for atmospheric light detection and ranging or LIDAR research. An unwanted copper vapour laser was transferred to Adelaide University. Details of research approvals and isotope purchases were provided for six projects to be undertaken this season.

- 6.45 There was some amendment to waste disposal arrangements. A hydroxide trap to absorb Carbon-14 labelled CO₂ was constructed for use at Davis. In the same period, Environchem Technologies was contracted to dispose of radioactive waste returned from Antarctica.

Australian Customs Service

- 6.46 With regard to update of source inventory information, notification of delay was received, however, with news that a number of detail changes to the inventory will appear in the final report. Discussions with Customs representatives helped to clarify Regulatory Branch principles regarding the circumstances when, and the conditions under which, deviations from specific requirements in relevant codes of practice may be approved. These will assist Customs in establishing acceptable specifications for proposed additional controlled apparatus.

Australian Quarantine Inspection Service

- 6.47 An update of source inventory information was received. No changes were noted for the quarter.

Parks Australia North

- 6.48 There were no significant issues of note reported during the quarter.

Australian National University

- 6.49 The regulatory assessment of facility licence applications for the operation of ANU accelerators continued.
- 6.50 ANU's action plan is well on track for timely compliance with the conditions of source licence S0027. A quarterly report was received in compliance with licence conditions, including updated source inventories for 11 schools, faculties or departments.
- 6.51 In compliance with special conditions of licence, the CEO of ARPANSA was provided with the qualifications and experience of the appointed Radiation Safety Officers for the following schools and faculties:
- Research School of Physical Sciences and Engineering
 - Faculty of Science
 - Research School of Chemistry.

Department of Defence

- 6.52 An officer from Regulatory Branch conducted an inspection of the Defence non-destructive testing capabilities at HMAS Albatross, Nowra. Defence requested the inspection with a view to establishing a non-destructive testing capability there. The current practice of out-sourcing this work to other bases is no longer cost-effective for the naval base.

7. International Liaison

- 7.1 An officer from Regulatory Branch attended an International Atomic Energy Agency (IAEA) meeting in Vienna from 10-14 February as Australia's representative on the Transport Safety Standards Committee. This was the eighth in a series of meetings that set standards for the transportation of radioactive materials globally, and are used extensively within Australia.
- 7.2 The Non-Ionizing Radiation Branch hosted Sydney Diedericks from the Radiation Control Directorate of the Health Department in South Africa during March. Mr Diedericks was briefed on the functions of the EMR Section, especially RF testing and compliance issues.
- 7.3 On request, Stuart Prosser forwarded a paper to the Nuclear Energy Agency in Tokyo, Japan, titled *The System of Radiation Protection: Views from the Australian Regulatory Authority*. This was based on his October 2002 presentation to the Asian Regional Conference on the Evolution of the System of Radiological Protection in Tokyo, Japan.
- 7.4 The CEO attended the International Conference on the Security of Radioactive Sources in Vienna in March. The conference, chaired by the US Secretary of Energy, pointed to the need to find and secure high risk 'orphan' sources and emphasised the importance of effective national infrastructures for safe and secure management of radioactive sources, including for their disposal.
- 7.5 Peter Burns attended the 50th Session of the United Nations Scientific Committee on the Effects of Atomic Radiation in Vienna from 27-31 January. The Committee reviewed its program of work and elected new office bearers. Peter Burns was elected Rapporteur of the Committee.
- 7.6 Geoff Williams attended the 15th meeting of the Waste Safety Advisory Committee of the IAEA in Vienna from 24-28 March. At this meeting a final draft of the new standard for the trade in commodities, titled *Radioactivity in Substances Requiring Regulation for Purposes of Radiation Protection*, was approved for sending to member states for their consideration.

John Loy
CEO
3 July 2003