



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 JULY TO 30 SEPTEMBER 2003



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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 At the July meeting of the National Uniformity Implementation Panel ((Radiation Control) (NUIP (RC)), responses to issues identified at the June NUIP (RC) meeting were discussed. Issues included mutual recognition, criteria for registration of radiation equipment and pre-requisites for licensing of occupational groups.

The panel agreed that rather than mutual recognition protocols, the directory should include national competency requirements in relation to use of radiation for particular occupations. The panel agreed to examine courses and pre-requisites relevant to the identified occupations.

The revised reporting requirements for the Australian Radiation Incident Register (a schedule of the National Directory) were finalised during the quarter - subject to the development of timelines for reporting.

Further information was sought from jurisdictions on their current arrangements in relation to provisions of the draft National Directory. This will be used to assist in drafting the Regulatory Impact Statement.

National Competition Policy Review of Radiation Protection Legislation

- 1.2 The Allen Consulting Group Pty Ltd was appointed to carry out NCP review

projects three and four (Regulatory Styles and Third Party Certification respectively). Projects three and four were 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 Work continued on the construction and operation of radionuclide air monitoring stations. ARPANSA continues to operate and maintain the five radionuclide air monitoring stations in Australia – at Melbourne, Perth, Townsville, Darwin and the Cocos Islands. Proposals for ongoing contracts for operation and maintenance for the mainland Australian stations and the station at Kavieng, PNG, were submitted to the Comprehensive Test Ban Treaty Organisation and were under negotiation. Work continued on a Request for Proposal for the establishment of infrastructure, installation, initial testing, liaison and other support services for a radionuclide station at Macquarie Island.

Radiation Emergencies

- 2.2 The Health Physics Section continued to maintain a Radiation Emergency Centre at ARPANSA's Yallambie premises and a 24-hour emergency contact point for the agency. A radiation emergency duty officer and an on-call radiation team was provided for visits by three nuclear powered vessels during the quarter. The Environmental and Radiation Health Branch provided radiation monitors and analysed marine samples for these visits.
- 2.3 In July advice was given to the National Chemical, Biological and Radiological (CBR) Working Group on radiation monitoring equipment for a CBR Enhancement Program and in August an officer of the Health Physics Section attended a Commonwealth meeting planning for re-entry of radioactive space debris.

Conferences, meetings and technical advice

Medical Radiation Branch

- 2.4 On July 19-20, Peter Thomas attended a joint two-day conference of the RANZCR and the International Radiology Quality Network. The meeting was driven by the need that all practices be quality accredited by November 2005.
- 2.5 The International Workshop on Recent Advances in Absorbed Dose Standards (AbsDos 2003) was hosted by the Ionizing Radiation Standards (IRS) section, at Yallambie on August 19-21. 31 delegates attended the workshop, including 16 from overseas countries. Invited speakers were Dr Frank Pernicka from the International Atomic Energy Agency (IAEA), Vienna, and Mr Robin Bentley from the National Measurement Laboratory, Sydney.
- 2.6 Julian Thomson co-chaired a session on *General Aspects of Safety in Diagnostic*

Radiology at the World Congress of Medical Physics held in Sydney on August 24-29.

- 2.7 Kevin Rafferty attended the Royal Australian and New Zealand College of Radiology (RANZCR) conference in Brisbane on September 17-25 to promote the ARPANSA Personal Radiation Monitoring Service (PRMS).
- 2.8 A paper by Keith Wise, *Solid cancer risks from radiation exposure for the Australian population*, was published in *Australian Physical and Engineering Sciences in Medicine* (2003), 26(2), 53-62. A shorter paper was also accepted for publication in *The Radiographer*.

Environmental and Radiation Health Branch

- 2.9 Environmental Radioactivity Section provided advice to COMCARE on several claims for compensation by individuals arising from possible exposure to fallout from the 1950s British nuclear tests at Maralinga.
- 2.10 In August and September four ARPANSA staff, accompanied by a representative of the South Australian Environmental Protection Agency, undertook a radiological field monitoring visit to Maralinga. The monitoring was done as part of the Maralinga Land and Environment Management Plan at the request of the Department of Education, Science and Training (DEST).
- 2.11 The aim was to check for possible changes to the radiological situation in the three years since the rehabilitation and associated monitoring were completed. No new hazards were observed and no migration of radioactive contamination into rehabilitated areas was detected. Radiation levels accorded with expectations. Further trips at intervals of approximately two years are planned before a review of the program in 2010.
- 2.12 On August 28 Stephen Solomon presented a talk titled *Radiological incidents – Beyond the physical effects and dealing with the consequences* at the CBR Defence conference in Sydney.

Public communication activities

- 2.13 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.
- 2.14 Comments provided by members of the EME Reference Group on the draft Government's Committee on Electromagnetic Energy Public Health Issues (CEMEPHI)/ARPANSA EME fact sheets were considered and the fact sheets were re-drafted to reflect changes. The new fact sheets were released during July and are available on the ARPANSA website.
- 2.15 NIR Branch staff finalised the design of the Electromagnetic Radiation (EMR)

Health Complaints Register. The register was launched by a national media release on July 4.

- 2.16 Information on UV protection was provided to the Swiss Erythropoietic Protoporphyrin Foundation. Information on UV from blacklights was provided to the NSW Cancer Council. The QLD Cancer Fund and the Cancer Council of SA were informed about UVR and ozone depletion.
- 2.17 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 proposed National Radioactive Waste Repository, the possible health effects of mobile phones and base stations, radiation leakage from microwave ovens, UVR exposure, and operations of the Australian Nuclear Science and Technology Organisation (ANSTO) at Lucas Heights.

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

Non-ionizing radiation

- 3.1 A manuscript on a collaborative study between ARPANSA, the Bureau of Meteorology and the National Radiological Protection Board in the United Kingdom on measurements and forecasts of the UV Index was accepted for publication in *Photochemistry and Photobiology*.
- 3.2 A collaborative study with Dr Cheryl Wilson of the Clothing and Textile Sciences Faculty of the University of Otago in Dunedin, New Zealand, continued. 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. The study was also extended to cover high visibility clothing worn by outdoor workers.
- 3.3 NIR Branch staff met with members of the Electricity Supply Association of Australia and the Victorian Department of Human Services (Radiation Safety Program) to discuss, and redraft, the proposal for a Victorian survey of residential magnetic fields.
- 3.4 The tender for the audit of 60 mobile phone stations was released in June and the successful tenderer (EMC Services) was decided in July. The measurement phase of the project was completed and half of the reports forwarded to ARPANSA. A series of measurements were conducted by an ARPANSA staff member to validate those conducted by the successful tenderer.
- 3.5 In addition, a thorough investigation of microwave oven leakage was performed over the period. Specific Absorption Rate measurements of the leakage were performed at EMC Technologies' laboratory. Results of the study were presented in October at the Australasian Radiation Protection Society Conference in Hobart. In general, new microwave ovens leak more than they did in the past. This could be

due to cheaper materials and methods in microwave oven manufacturing. It must be stressed, however, that leakage levels dropped off within centimetres of the oven surface. At positions where an operator is likely to be standing the levels are well within safety limits.

Medical radiation

- 3.6 The Medical Physics Section continued its national survey on radiation doses from general diagnostic radiology. Exposure measurement kits and patient examination questionnaires were sent to the second group of randomly chosen participants.
- 3.7 As part of the RMIT University professional development program, two third-year Applied Physics students began working with the Ionizing Radiation Section. One student was working on the Labview implementation for dosimetry measurement. The other student was assisting Milly Cox in the study of the dosimetry of narrow profile megavoltage photon beams similar to those used in stereotactic and intensity modulated radiotherapy treatments. Profiles of these beams began to be produced and analysed, modelling them with the BEAM Monte Carlo simulation code.
- 3.8 Results from the second batch of the national therapy quality assurance therapy dosimetry TLD audit were finalised. Reports were issued to the participating centres and interim provisional results were placed on the ARPANSA website.

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 received the following requests for calibration jobs during the quarter:
- 34 monitors with 39 probes;
 - 36 personal dosimeters; and
 - three sensors.
- 4.2 Medical Radiation Branch's Ionizing Radiation Standards (IRS) Section dosimetry calibration service completed one therapy calibration and two protection level calibrations. Five calibrations were in progress for internal groups – including the Regulatory Branch and the PRMS.
- 4.3 On September 1 the National Standards Commission formally appointed the head of the IRS Section, Duncan Butler, as a verifying authority for reference standards of measurement. The verifying authority is for absorbed dose, absorbed dose index, kerma and specific energy imparted (ionizing radiation). Duncan attended a legal metrology course at the National Standards Commission and the National Measurement Laboratory on September 30 to October 2.

Fabric testing and labelling

- 4.4 Fabric ultra-violet protection factor (UPF) testing, licensing and labelling continued. 122 jobs were received, involving the testing of 449 fabric samples. In addition, 27 UPF trademark licences were completed and 1,045,000 UPF swing tags were issued. Four pairs of sunglasses were tested for their UVR protection properties during the quarter.

UVR data and hazard assessments

- 4.5 Two industrial UVR hazard assessments were commenced. These involved solar UVR exposure through skylights in a Sydney workplace and hazard assessment of employee exposure to UVR in a printing firm. Calibration of UVR detectors was carried out on a commercial basis for Tech Rentals.
- 4.6 UVR data for Melbourne and Adelaide was provided to the RMIT Environmental Science Program. UVR data was also supplied to the Bureau of Rural Sciences for its *State of the Environment Report*.

QA program for radiopharmaceutical products

- 4.7 All batches of radiopharmaceuticals tested in the quarter complied with specifications.
- 4.8 A memorandum of understanding between the Therapeutic Goods Administration and ARPANSA was signed on August 6. The memorandum requires ARPANSA to provide services for the evaluation of applications to register (or vary the conditions of registration) of radiopharmaceuticals and to conduct quality assurance testing of radiopharmaceuticals.

Surveillance of effluent discharges at ANSTO's HIFAR reactor

- 4.9 A total of 34 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

- 4.10 205 samples were tested against requirements of the Australian Drinking Water Guidelines.

Certification of radioactivity in exported foodstuffs

- 4.11 Measurements of the radioactivity content of 15 foodstuffs destined for export were carried out on request and six Radioactivity Certificates were issued for shipments of exported foodstuffs.

Personal Radiation Monitoring Service

- 4.12 The PRMS continued to offer a comprehensive radiation monitoring service for

persons who may be exposed to ionizing radiation as a consequence of their occupation. A service is also provided for the measurement of radon and natural background radiation levels. The PRMS was internally audited on September 24 for compliance with ISO 17205.

5. Council and Committee Operations

Radiation Health and Safety Advisory Council

- 5.1 The Council met on July 31 in Melbourne. A summary of the meeting is at <http://www.health.gov.au/arpansa/rhsac.htm>

The Council endorsed the CEO's processes for consultation with the public at its July meeting. The endorsed paper was released in September and is available at http://www.arpansa.gov.au/rhsac_stat.htm

Radiation Health Committee

- 5.2 The Radiation Health Committee (RHC) met on July 23 and 24. A summary of the meeting is available at http://www.arpansa.gov.au/rhc_mt.htm

Nuclear Safety Committee

- 5.3 The Nuclear Safety Committee (NSC) met on July 14 in Sydney for a briefing on the reactor pool penetrations. A record of the meeting is available at <http://www.arpansa.gov.au/nsc.htm>.

Radiation Protection Series publication program

- 5.4 The regulatory impact statement (RIS) for the draft *Code of Practice for radiation protection and radioactive waste management in mining and mineral processing* was sent to the Office of Regulation Review (ORR) during the quarter. So too was a further draft of the RIS for the draft *Code of practice for the safe use of portable density and moisture gauges containing radioactive sources*.

The public submission period for the draft *Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation* and its accompanying RIS closed during the quarter. Six submissions received from the consultation process will be considered in finalising the draft Code and RIS for the advice of the Radiation Health Committee and Radiation Health and Safety Advisory Council to the CEO of ARPANSA.

6. Regulation

Licensing

Licence Applications

6.1

<i>Type of application</i>	<i>From</i>
Source - non-ionising apparatus	ANSTO Environment
Source	Department of Environment and Heritage - Australian Antarctic Division.
Facility - to site, construct and operate a waste repository.	DEST

Application Assessment and Licence Issuance

6.2

<i>Type of licence and authorisation</i>	<i>To</i>
Source - operation of a baggage inspection x-ray unit	Attorney-General's Department
Facility - operation of the Radiotracer Facility	ANSTO Environment
Facility - operation of the Ore Processing and Operations Facility	ANSTO Environment
Source - amendment combining previously issued source licences into a single source licence.	ANSTO

6.3 A first draft was completed of a Regulatory Branch guideline that will assist in the assessment of an application to commission the Replacement Research Reactor (RRR) or to commission modifications to the RRR. The guideline, which is specific to the RRR, is undergoing internal review.

6.4 The Regulatory Assessment Report for operating a prescribed radiation facility of ANSTO Environment, namely the 2MV Tandetron, progressed during the quarter.

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

6.5 The Regulatory Branch issued 85 Customs Prohibited Release permits for the importation of non-medical radioisotopes. These comprised of 58 single-shipment, 25 urgent requests and two twelve-monthly permits.

- 6.6 The Radiopharmaceutical Section issued 103 Customs Prohibited Release permits for the importation of medical radioisotopes. These were comprised of 88 single-shipment permits, 11 twelve-monthly permits and four faxed permits.

Monitoring compliance under the ARPANS Act

ANSTO - Replacement Research Reactor Construction Licence

- 6.7 ANSTO submitted 16 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. 11 of these received CEO approval during the reporting period, in addition to nine that were submitted in the previous quarter. One of the RFAs covered the services for the Cold Neutron Source.
- 6.8 The CEO imposed five additional licence conditions under Section 36(2)(a) of the ARPANS Act during the quarter.
- 6.9 The action status of licence condition 4.6 relevant to the construction of some important control and safety system equipment was followed up with ANSTO by means of a collated list of pending expectations and a subsequent meeting at ANSTO.

ANSTO - HIFAR Reactor Operations

- 6.10 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 July and September. One new project was identified during the quarter. The new project is not safety significant. 16 projects were in progress, while a further two had reached practical completion and one had reached final completion.
- 6.11 The CEO approved two modifications to Safety Category 1 systems during the quarter. Both systems were related to the containment isolation provisions for the facility. The information provided by ANSTO demonstrated that the modifications were adequately conceived, planned, and resourced to be implemented safely.
- 6.12 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.
- 6.13 ARPANSA continued reviewing an ANSTO proposal to amend a condition relating to plant staffing.
- 6.14 ARPANSA received two reports to address special licence condition 3.7 dealing with accident analysis. Regulatory officers began to review these reports.
- 6.15 ARPANSA received a report to address special licence condition 3.6(a) dealing with seismicity. Regulatory officers began to review this report too.

- 6.16 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

- 6.17 **Planned Inspections**
Planned inspections were conducted of ANSTO Engineering and the Bragg Institute. Final inspection reports were prepared and issued by the Regulatory Branch. These indicated satisfactory compliance with licence conditions.
- 6.18 **Source Inventory Workbooks**
Source Inventory Workbooks were issued for each ANSTO division dealing with controlled material or controlled apparatus. Source holdings were confirmed and will form the baseline for all future reporting.

ANSTO Inspections

- 6.19 Two Regulatory Branch officers made two visits to Building 20B to obtain further information about the current status of the facility and to attend a presentation made by ANSTO on immobilisation of radioactive Mo-waste.
- 6.20 Two Regulatory Branch officers visited Building 23 to discuss the proposed changes to the ventilation system.
- 6.21 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 log keeping during the program was good.
- 6.22 Two routine information gathering inspections were conducted of the HIFAR reactor during the quarter. Of particular interest was maintenance, operations, procurement, plant and staffing. The staffing of the replacement reactor and its possible affect on the HIFAR reactor was also considered.
- 6.23 There were 29 inspections carried out in relation to the Replacement Research Reactor Project. Of these 26 were conducted at sub-contractors premises to check on the manufacture of components for the reactor plant. The other three were examinations of the construction progress, examining concreting and installation of piping, plant and equipment.

ANSTO – Moata Research Reactor

- 6.24 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 care and maintenance of Moata;

- No modifications to plant and procedures were identified as necessary for the care and maintenance of the Moata reactor during the quarter;
- Modifications to Moata care and maintenance documentation occurred during the quarter to represent the change in responsibility from the former Physics division to Nuclear Technology. Other modifications were also made to ensure the information is kept up to date. Modifications were awaiting approval;
- Replacement of the crane located in the Moata reactor building occurred on July 5-6. Modifications went as planned and were performed by Kone Cranes with the assistance of ANSTO staff. This has no effect on the Moata reactor facility; and
- No radioactivity was released to the environment.

ANSTO Fuel Operations

- 6.25 ARPANSA received a quarterly report on compliance with licence conditions.
- 6.26 Progress in satisfying Special Licence Condition 3.7(e) in the Facility Licence No. FO0044-4C reached the point where ANSTO completed o-ring replacements in PuO₂ containers during the IAEA inspection on July 23-25. During the next IAEA inspection, expected before December 2003, the PuO₂ containers will be placed into specially designed stainless steel overpacks in a new rack system.
- 6.27 An upgrade of the Building 23 spent fuel storage pond purification system was in progress.
- 6.28 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.
- 6.29 There are two boreholes for monitoring ground water close to the Building 23 and 41 ponds in compliance with a Special Licence Condition. Water sampling radiological analysis from the two boreholes takes place on an annual basis as part of overall ANSTO Environmental Management Plan. Sampling of these boreholes was completed in August. The initial results for alpha, beta and gamma radiation were low and are comparable to other background values around the Lucas Heights Science and Technology Centre site.
- 6.30 ANSTO reported that the Safety Analysis Reports (SAR) for Fuel Management section were prepared and will all be submitted prior to 31 March 2004. The SAR for Building 23 and the SAR for Nuclear Material Store will be submitted to ARPANSA in the December quarter.
- 6.31 Special Licence Condition 3.7(h) in the Facility Licence No. FO0044-4C was considered by ANSTO. The Nuclear Material Store (NMS) has appropriate fire detection systems in place including smoke detectors, optical fibre fire detectors, thermal detectors and an Inergen fire suppression system. Criticality certificates are updated and issued for the NMS by ANSTO. Monitoring for a potential release of

compounds of fissile materials was assessed by ANSTO and a cost-effective system involving the use of electrochemical sensors was recommended.

- 6.32 Progress in satisfying Special Licence Condition 3.13 (Schedule 3) in Facility Licence No. FO0044-4C reached the point where ANSTO developed a criticality awareness training module that includes lecture notes, presentation files and sample exam papers. This training module will be provided to relevant Licence Nominees, Licensing Officers, Facility Officers, Responsible Officers and any other staff whose need to receive such training is regarded by the Nominee as necessary. A schedule for implementation of training program was being prepared with the aim to conduct the first course by the end of 2003.

ANSTO Waste Operations and Technology Development

- 6.33 ANSTO Waste Operations and Technology Development (WOTD) is licensed as a nuclear installation and is operated under Facility Licence FO0044-WOTD. A licence condition requires ANSTO Nuclear Technology to submit quarterly reports to the CEO of ARPANSA. The report ARPANSA received during the September quarter addressed the following areas:

6.34 **Safety Analysis**

- A special licence condition requires the licence holder to submit the final safety analysis reports for the facilities of WOTD. The licence holder submitted four safety analysis reports during the quarter, which were under ARPANSA review.

6.35 **Abnormal Occurrences**

- No abnormal occurrences occurred during the quarter.

6.36 **Modifications**

- Building 20B was being extended for future expansion of waste services. ARPANSA approved the Stage 3 Submission to occupy the Waste Treatment and Packaging Building (B20B) and utilise the laboratories within the building.

6.37 **Airborne Discharges**

- It was reported that the airborne discharges from stacks of WOTD remained below the quarterly notification level. The airborne discharges are also covered separately under airborne discharges in the ARPANSA Quarterly Report.

6.38 **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 liquid discharges of ARPANSA Quarterly Report.

6.39 **Inventories**

- The updated inventories stored on the LHSTC site and all changes in stored inventories occurring in this quarter are presented in this quarterly report.
- There was a change in the previously reported value in depleted uranium due to inaccuracies in the old safeguards database of nuclear materials. This change is under safeguards administration.
- The updated list of the source register is presented in this quarterly report.

ANSTO Radiopharmaceuticals and Industrials

6.40 ANSTO Radiopharmaceuticals and Industrials (ARI) is licensed to operate four nuclear installations and three prescribed facilities in 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). Licence conditions require ARI to submit quarterly reports to the CEO of ARPANSA. The report received for the September quarter addressed these areas:

6.41 **Modifications**

- ARPANSA received a report on ‘Repairs to Final Completion on the Building 54 (B54) ventilation system’.
- The ventilation upgrade of B54 is complete and operational. ARPANSA received the final commissioning report for this upgrade.

6.42 **Relevant changes**

- Under Regulation 51 ARPANSA approved the proposed change to control system for Automatic Carbon Filter Deluge of the Building 23 (B23) ventilation system.
- A new Senior Customer Service Officer and a Business Accountant were appointed. Such change is unlikely to have significant implications for safety and reporting of this change satisfies Regulation 52.

6.43 **Effective Control**

- A special licence condition requires maintaining a current inventory of all controlled materials and controlled apparatus. The ARI quarterly report mentioned that the second stage of BIS/SAP covering the production and quality management is in the developmental change. The implementation of the BIS/SAP system is in its final stages and it was envisaged that the system would ‘go live’ around mid-November.

6.44 **Safety Management Plan**

- A special licence condition requires formal accreditation of operators. The ARI

quarterly report mentioned that all operators had completed the accreditation program for GMP and it is envisaged that the next learning unit, *Radiation Safety in Our Plant*, will be completed by first quarter of 2004.

- A special licence condition requires the licence holder to consider in the Safety Analysis Report external events including the seismic hazard, maximum inventory of radionuclides trapped in the HEPA and charcoal filters, and also the bases of decontamination factors used in the operational limits and conditions. The quarterly report stated that the revised Safety Analysis Report was under review by the Director of ARI and would be provided to ARPANSA as soon as possible.

6.45 **Radioactive Waste Management Plan**

- A special licence condition requires the licence holder to develop and maintain procedures for management of radioactive wastes and characterisation of radioactive wastes. The quarterly report mentions that the procedures will be written and implemented in line with the new BIS/SAP system - expected to be completed by March 2004.

ANSTO Environment

6.46 **Accelerators**

ANSTO Environment is licensed to operate the ANTARES Tandem Accelerator (F0044-6Ba) and 3MV Van de Graaff Accelerator (F0044-6Bb) as prescribed radiation facilities. ANSTO Environment is also licensed to site and construct a 2MV Tandem Accelerator (Tandetron) as a prescribed radiation facility under Facility Licence F0134. A licence condition requires ANSTO Environment to submit quarterly reports to the CEO of ARPANSA. The report received for the September quarter mentioned that:

- No abnormal occurrences, incidents or accidents occurred in relation to these facilities.
- There were no modifications to plant and procedures for the 3MV Van de Graff and 2MV Tandetron Accelerators. However, first stages of the replacement of computer control system for ANTARES continued. There was no change in safety and control features of the original system.
- No radioactivity was released to the environment.
- The Safety Analysis Report (SAR) of ANTARES was undergoing final assessment by the ANSTO Safety Assessment Committee.
- The SAR for the 2MV Tandetron was nearing completion.

6.47 **Ore Processing and Operations Facility**

ANSTO Environment is licensed to operate ore Processing and Operations Facility

(F0044-7A) as prescribed radiation facility. The September quarterly report mentioned that:

- There were modifications to plant and procedures to the Pilot Plant in Building 21H. Experimental work on processing uranium liquors in a pipe reactor was carried out, covered under a SAC approval (SAC 1634/03), after appropriate hazard analysis. Fabrication of the experimental rig began for this purpose, which will be dismantled once the experiment is completed. ARPANSA will confirm such modifications by a visit to the facility.
- No abnormal occurrences, incidents or accidents occurred during the last quarter.
- No radioactivity was released to the environment.

ANSTO Materials Division – Actinide Suite

- 6.48 The quarterly compliance report addressing all licence conditions for the September quarter was received on October 27. 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.
- 6.49 No abnormal occurrences were reported for the facility during the quarter.
- 6.50 The annual report for the facility was received on September 29. The facility has operated safely within its operational limits.

ANSTO – Secondary Standards Dosimetry Laboratory

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

Abnormal Occurrences at ANSTO's Nuclear Installations

- 6.52 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.
- 6.53 **HIFAR**
ARPANSA was notified of one abnormal occurrence in the quarter. During a routine test of the electrical power supply diesel generators, a temperature alarm was recorded. Technicians determined the cause to be a faulty thermostat. The occurrence did not have significant safety implications.

ANSTO Airborne Radioactive Discharges

- 6.54 The Regulatory Branch review of all airborne radioactive discharges reported by ANSTO for the period June 24 to September 23 showed that discharges remained

less than the quarterly notification levels under the licence authorisation. The radiation dose at 1.6 km from the HIFAR reactor from all airborne discharges for the quarter was less than two microsieverts 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

6.55 The Regulatory Branch conducted a review of ANSTO's reports of liquid radioactive discharges from the Lucas Heights Science and Technology Centre from June 30 to September 30. It was found that these discharges complied with the Trade Waste Agreement of June 30 between Sydney Water and ANSTO, with all measured values at most a few per cent of the relevant limit.

ARPANSA Melbourne – Medical Radiation Branch

6.56 ARPANSA's Medical Radiation Branch is licensed to operate the linear accelerator and teletherapy facility as prescribed radiation facilities under the licence F0046. A licence condition requires the licence holder to submit quarterly reports to the CEO of ARPANSA. ARPANSA received a report in the September quarter covering these areas:

6.57 **Quality system**

- Both facilities are covered by a quality system consistent with ISO/IEC 17025. It is mentioned that as the Ionising 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 by the end of 2004.

6.58 **Training, accreditation and authorisation**

- The quarterly report mentioned that criteria were established and documentation was being updated with the quality system – scheduled for completion by February 2004.

6.59 **Safety tests, inspections and reviews**

- It was reported that procedures exist and documentation is being updated with the quality system and the target date of completion is March 2004.

6.60 **Emergency arrangements**

- It was reported that emergency arrangements are in place and testing of interlocks is undertaken routinely. The development of suitable exercises for biennial review is in progress.

6.61 Operating limits and conditions

- The report mentions that further clarification on operating limits and conditions is progressing.

6.62 Radiofrequency exposure levels

- It was also reported that the radiofrequency levels were measured but no significant levels were detected. The next review of radiofrequency exposure is scheduled for February 2004.

CSIRO

6.63 All source inventory information had 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.

6.64 Neutron Accelerator Facility

The Facility Licence includes a special condition requiring a review and update of standard operating procedures by September 30. This information was received and formal compliance with the licence condition acknowledged. A quarterly report was also provided. This included nothing of note.

6.65 Textile and Fibre Technology

Information was received during the June quarter indicating the intention to resume use of an x-ray diffraction apparatus. This was to commence with the training of a potential operator. ARPANSA received formal notification under Regulation 52 in August.

6.66 Corporate Property

A quarterly report was received indicating no change to ongoing arrangements.

6.67 Entomology

Whilst making an enquiry regarding the operation of neutron moisture meters, the radiation safety officer indicated that there had been some difficulty in obtaining commercial transport for radioactive material.

6.68 Plant Industry

The division operates over eight sites. In September a quarterly report indicating no incidents, high radiation doses or new dealings was received together with an update of the source inventory. This notified disposal of:

- a series of unsealed sources from premises being closed at North Ryde;
- surplus UV sources from Black Mountain; and
- a small unsealed source from Adelaide.

An annual review of the Safety Management System was received. This included

updated Radiation Safety Operating Guidelines for the 3.7 TBq Cobalt-60 source.

6.69 **Livestock Industries**

Notification was received of the transfer of ownership of a 960 TBq gammacell irradiator to a private company for refurbishment. A special licence condition requiring the formal provision to the CEO of any sealed source certificates remains outstanding.

6.70 **Forestry and Forest Products**

A report for the June quarter was received in August. This included reviewed rules for the safe transport and use of the neutron moisture meter. These result from a risk assessment following the previously reported transport incident. Also noted were results from a survey of the Sandy Bay, Tasmania, storage shed.

Formal notification was received of the transfer of two sealed sources to Monash University.

6.71 **Exploration and Mining**

Notification was received of transfer of a small sealed source to Vietnam as a part of an instrument developed by CSIRO.

6.72 **Minerals**

A source inventory update was received as required by a special condition of licence. Quarterly and annual reports in response to Regulations 52 and 50 were also received during the quarter.

The annual report notes that a number of amendments were made to the inventory of controlled sources. However no additional kinds of source were acquired for use during the reporting period. No incidents of radiological concern were reported. Individual recorded doses were unexceptional. During the past year reviews of security arrangements have been undertaken at two of the four sites occupied by the division.

6.73 **Manufacturing and Infrastructure Technology**

A report for the June quarter was received in July. The source inventory update included some changes to the locations of some sources.

6.74 **Telecommunications and Industrial Physics**

During the June quarter a notification of delay was received with regard to update of source inventory information. This had not been received by the end of the September quarter.

As a part of the reorganisation foreshadowed in reports from last quarter, information was received that the current laser safety officer is likely to be retrenched. He provided an advance copy of a laser safety report dated July 18. Results of a review of eye examinations for laser workers shows that few, if any, have received pre-employment examinations as recommended in laser standard AS/NZS 2211.1:1997. With regard to the laser eye-strike incident notified last

November, the individual concerned has had follow-up eye examinations. It now seems likely that no permanent damage has been done. Regular, follow-up examinations have been advised.

Australian Institute of Marine Science

6.75 The site Radiation Safety Officer notified ARPANSA that there have been no relevant changes in the past quarter. This information is to be provided formally by the licence holder.

Australian Antarctic Division

6.76 A comprehensive quarterly report for the June quarter was received in July. This included details of a proposal for modified underwater laser apparatus.

Australian Customs Service

6.77 Customs continued to operate three Container Examination Facilities – at Fisherman Island, West Melbourne and Matraville.

The licence holder reported that:

- operators continued to receive formal and on the job training for safe operation of the accelerators;
- procedures were updated in accordance with the requirements of ISO 9000; and
- there were no abnormal radiation occurrences or exposures.

Parks Australia North

6.78 A comprehensive quarterly report was received. This included no information of radiological significance.

Australian National University

6.79 Three planned compliance inspections were carried out of the following:

- Dealings with sources held by Research School of Chemistry under Source Licence S0027(11);
- Dealings with sources held by Faculty of Science Radiation Store under Source Licence S0025(10); and
- Operation of a 1.7MV NEC Tandem Accelerator by the Research School of Physical Sciences and Engineering, under Facility Licence F0074(2). The inspectors found that the dealings with sources and operation of the accelerator were generally good and consistent with organisational plans and arrangements for radiation protection. The licence holder representatives were knowledgeable of radiation protection and regulatory matters and responsive to the inspection.

- 6.80 The licence holder reported in July on compliance for the May-July 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 eight schools, two faculties and one department was included.

Department of Defence

6.81 As Defence matures as a regulated entity it continues to uncover small radioactive sources and sources of non-ionising radiation across Australia that warrant inclusion in its inventory of controlled material. Defence has set up a centralised database, based on the ARPANSA database format for ease of reporting, and efforts to fully complete the database continued during the quarter.

6.82 Defence continues to report incidents with radiofrequency (RF) exposure to workers, normally during calibration and testing of radar units. During the quarter, however, it reported a RF exposure to around 20 defence personnel during flight when a radar unit became misaligned and irradiated the cabin. ARPANSA and Defence are investigating the possible worker exposures and causes.

6.83 **Source Licence**

Defence continued efforts with the updating of its SAFETYMAN (Radiation) documentation and compliance with other source licence conditions during the quarter.

6.84 **Facility Licences**

Defence supplied additional information relating to the licence applications for the Bandiana waste storage, and the Bandiana calibration facility, during the quarter. Defence has contracted for the development of an updated site management plan and waste management system relating to the Woomera waste storage facility licence application.

7. International Liaison

7.1 ARPANSA officers attended meetings of the IAEA's Radiation Safety Standards Committee (RASSC) and the Waste Safety Standards Committee (WASSC). The then Director of Standards Policy and Operational Support Branch, Ches Mason, chaired the joint meeting of the RASSC and WASSC. Geoff Williams of the Environmental and Radiation Health Branch represented Australia at the meetings of the WASSC. Alan Melbourne of the Environmental and Radiation Health Branch

- attended the meetings of RASSC as an observer. The two Committees met jointly to discuss further developments in a draft safety guide (DS161) which seeks to establish criteria to avoid unnecessary regulation of international trade in commodities containing small quantities of radioactive substances. As a result of concerns raised by Australia and other member states, the title, objective and scope of the draft safety guide were changed.
- 7.2 Various IAEA draft standards were released to member states for comment during the quarter. ARPANSA sought comment on these draft standards from radiation regulators and relevant industry bodies. As part of the consultation process for DS161, ARPANSA officers met with the tantalum industry to discuss the potential implications for the industry. Comments were also sought from radiation regulators on standards relating to the storage and geological disposal of radioactive waste.
- 7.3 Richard O'Brien attended the first plenary meeting of the Environmental Modelling for Radiation Safety (IAEA) project in Vienna, Austria, and was appointed to the working group on Naturally Occurring Radioactive Material modelling. This project is intended as a follow up to the Biospheric Modelling Validation Study and the the Biospheric Modelling and Assessment project, with the emphasis on environmental modelling. Other working groups have been set up to look at radioiodine, tritium, carbon-14 etc.
- 7.4 David Webb, as Chair of the Asia Pacific Metrology Program Technical Committee for Ionizing Radiation, attended a meeting of representatives of regional measurement organisations at the International Bureau of Weights and Measures (BIPM) in Paris September 25-26. The purpose of the meeting was to approve ionizing radiation calibration and measurement capabilities submitted for entry to Appendix C of the Mutual Recognition Arrangement (MRA) key comparison database.
- 7.5 Ken Karipidis attended a meeting of the New Zealand Interagency Committee on Electromagnetic Fields on September 2 in Wellington, New Zealand. Participation at the meeting commenced formal contact between ARPANSA and the committee. It is envisaged that further communication will be via correspondence.
- 7.6 A Regulatory Branch officer attended the ninth International Conference on Environmental Remediation and Radioactive Waste Management, September 21-25, Oxford, England.

John Loy
CEO
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