



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

**QUARTERLY REPORT
OF THE
CHIEF EXECUTIVE OFFICER
OF ARPANSA
FOR THE PERIOD 1 APRIL 2006 TO 30 JUNE 2006**



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and Nuclear Safety Agency**

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Further Information About This Publication

If you would like to know more about the content of this publication please contact ARPANSA's Manager Policy and Security of Sources on 1800 022 333 or e-mail at info@arpansa.gov.au. Further information about ARPANSA can be found on the Agency's website at www.arpansa.gov.au.

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Letter of Transmittal

23 November 2006

The Hon Christopher Pyne MP
Parliamentary Secretary to the Minister for Health and Ageing
Parliament House
Canberra ACT 2600

Dear Parliamentary Secretary

The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- the operations during the quarter of the CEO, ARPANSA, the Radiation Health and Safety Advisory Council (the Council), the Nuclear Safety Committee (the NSC) and the Radiation Health Committee (the RHC);
- 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 Council and the NSC under paragraph 20(f) or 26(1)(d) of the Act; and
- a list of facilities licensed under Part 5 of the Act.

I am pleased to provide you with a report, meeting the requirements of the Act, covering the period 1 April 2006 to 30 June 2006. I regret the delay in providing you with this report which was principally due to further review of the most efficient and effective format of the report.

As you would be aware, Section 60(6) of the Act requires you to cause a copy of the report to be laid before each House of the Parliament within 15 sitting days of the day on which this report was given to you.

Yours Sincerely

John Loy
CEO of ARPANSA

Report on the operations of the CEO and ARPANSA

Following are the highlights of ARPANSA's operations over the past quarter.

Knowledge, information and services

Ultraviolet Radiation (UVR)

An international collaborative project to investigate UVR exposures of parents and children when visiting pools in summer has commenced with the University of Hawaii and Emory University in the USA. ARPANSA's expertise in quantification and measurement of UVR is being utilized in this large multidisciplinary intervention study seeking to prevent adverse health effects. Preliminary work has commenced on a collaboration study with Curtin University of Technology. The UVR study titled "Assessing the Effect on Sun Protection Behaviours of Various UV Index Displays at Beaches and Public Swimming Pools" should commence in the summer of 2006/7.

The report of the collaborative study on the UVR protection provided by hats used in schools with the Australian Cancer Society was published in the May-June issue of the journal *Photochemistry and Photobiology*. An initial summary of the results from the collaborative study with the Cancer Council South Australia and Treenet/Waite Institute of the University of Adelaide to measure the effectiveness of various species of Australian trees in providing protection against solar UVR was presented at the Workshop *UV Radiation and its Effects: An Update* in Dunedin, New Zealand in April, 2006.

NATA reassessment of ARPANSA's UPF testing service was carried out during May, 2006. This resulted in continuing accreditation for a further two years.

Electromagnetic Radiation (EMR)

A meeting of the Electromagnetic Energy Reference Group (EMERG) was convened in Sydney on 22 May, 2006 and attended by representatives from government, industry and community groups. The meeting discussed issues relating to the use of radiofrequency electromagnetic radiation in communications technologies and included a presentation by the Australian Centre for Radiofrequency Bioeffects Research on current research activities in Australia. A proposal for an audit of electromagnetic energy levels from mobile phone base stations was considered by the group.

EMR section staff continued to provide information to state and federal governments, members of the public and the media regarding EMR and health. While the majority of enquires concern possible health effects of magnetic fields from electricity distribution, there was a significant increase in enquiries relating to mobile phone base stations, and microwave ovens. Other issues of significant concern to the community included satellite receiving antennas, broadcast transmitters and domestic appliances.

The measurements of 50 Hz magnetic fields in Melbourne homes have continued as part of a survey of approximately 300 homes. Measurements in about half of the required number of homes have been completed.

Environmental Radiation

Several results for the continuing Proficiency Testing Program in which Radioanalytical Services section participates were reported in this quarter. The laboratory achieved acceptable results for the analyses of: Tritium in water; Radium in water and Gross alpha- and beta-activity in water.

Radioanalytical Services also analysed 3 samples as part of the IAEA proficiency testing program for the re-vamped ALMERA (Analytical Laboratories for Measuring Environmental Radioactivity) Network. The ALMERA Network now has a greater focus on the rapid analyses required in response to a radiological emergency. Therefore, all participating laboratories were required to report the results within three working days of receipt of the samples. The results of this test will be reported as part of a broader proficiency test which concludes in September.

Documentation for the analysis of Radium-226 and -228 in water has passed internal audit and will be incorporated as part of a submission for accreditation by NATA in September, 2006.

Method validation for the analysis of Tritium in water has been completed and finalised documentation is being prepared so that this method may also be submitted for accreditation in September.

Method development for the analysis of Uranium in urine was completed and 34 samples collected as part of the ARPANSA-RMIT ARC project were analysed.

Tests on the solubility of uranium dust in lung fluid are continuing, but preliminary results have been reported.

Two members of section participated in the final field trip to Jabiru, investigating uranium uptake by workers in the U-mining industry.

The first commercial analyses for Polonium-210 in urine were conducted by the laboratory in this quarter.

The development of improved methods for the determination of Lead-210 and Ra-228 in water is continuing.

All six of the gamma-ray spectrometers were calibrated for the analysis of samples prepared in 200 ml Marinelli beakers.

Health Physics

Health Physics Section (HPS) and RMIT carried out a second series of lung monitoring measurements on Ranger Uranium mine workers at Jabiru, as part of ARC Linkage Project on occupational dose assessment. Members of the ERS also carried out analysis of urine samples provided by the Ranger workers.

HPS chaired a meeting of a RHC Working Group to prepare a discussion paper on remediation following a radiological attack.

HPS participated in a meeting of the RHC Working Group preparing the Code of Practice on the Security of Radioactive Sources.

HPS is continuing trials of a PocketPC-based field data acquisition system in collaboration with the Perth-based company ioGlobal. This system combines mobile phone and GPS technologies to transfer data collected in the field to a database on a secure WEB server maintained by ioGlobal for ARPANSA.

HPS is continuing the development of an automated system for track counting of nuclear track detectors for radon measurement, based on a high resolution slide scanner.

Work continued on the analysis of airborne radiometric survey data downloaded from the Geoscience Australia WEB site in order to assess the levels of natural background across Victoria and to identify locations with elevated levels requiring further investigation.

Medical Physics

The Medical Physics Section provided information on the testing of x-ray protective aprons and presented data on the transmission of x-rays through lightweight lead-free protective apron material at the Australian Institute of Radiographers annual scientific meeting.

The Section has established an arrangement for collaboration with staff at the Department of Radiology at Upstate Medical University, New York, United States to investigate an alternative dosimetric framework for the determination of patient radiation doses from Computed Tomography (CT).

Online Information

The number of users visiting the ARPANSA website has increased significantly in the past 12 months with 244,286 users visiting during this quarter compared with 124,195 during the same quarter of 2005. This represents an increase nearing 100%. Topics of most interest to visitors were in the non-ionising radiation field and included mobile phones, mobile phone base stations and solar ultraviolet radiation.

ARPANSA has commenced a redevelopment of its website with a view to improving the availability and accessibility of information and services. To this point, the redevelopment has involved an extensive usability study and the development and testing of a prototype website. The prototype displays a new information structure and navigation system which has performed well in usability testing. The next phase of the project will involve the application of an appropriately engaging graphic design along with the coding of webpages to the highest standards of accessibility. This work is expected to be completed in the following quarter.

Publications

ARPANSA staff authored or contributed to the following publications:

A comparison of Australian and Canadian calibration coefficients for air kerma and absorbed dose to water for ^{60}Co γ radiation, K R Shortt, R B Huntley, L H Kotler, J F Boas and D V Webb, *Aust. Phys. Eng. Sci. Med.* **29**, No. 2, 207-215 (2006).

Commission Internationale de L'Eclairage (the International Lighting Commission) Committee TC 6-29, Chaired by Dr Peter Gies (ARPANSA) report CIE 172:2006 *UV Protection and Clothing*.

Measurements of the UVR Protection Provided by Hats used at School. Peter Gies, John Javorniczky, Colin Roy and Stuart Henderson. *Photochem Photobiol.* 82:750-754, 2006.

Assessment of the UVR Protection provided by different Tree Species. Peter Gies, Robin Elix, David Lawry, Trevor Hancock, Jennifer Gardner, Sarah Cockerell, Colin Roy, John Javorniczky and Stuart Henderson. Proceedings of the Workshop “UV Radiation and its Effects: an update (2006)” Dunedin, April 19-21, 2006.

Measurement of the UVR Exposures of Expeditioners on Antarctic Resupply Voyages. Peter Gies, John Javorniczky, Colin Roy, Stuart Henderson, Jeff Ayton, Roland Watzl, Helen Cooley and Melissa Kingston. Proceedings of the Workshop “UV Radiation and its Effects: an update (2006)” Dunedin, April 19-21, 2006.

Measurements of Solar UVR at Australian Antarctic Stations. Stuart Henderson, Peter Gies, John Javorniczky, Colin Roy, Jeff Ayton, Roland Watzl and Des Lugg. Proceedings of the Workshop “UV Radiation and its Effects: an update (2006)” Dunedin, April 19-21, 2006.

Inter-comparison of Solar Spectral Irradiance Measurements in Melbourne. Peter Gies, Stuart Henderson, John Javorniczky, Colin Roy and Don Anderson. Proceedings of the Workshop “UV Radiation and its Effects: an update (2006)” Dunedin, April 19-21, 2006.

UV Index: Forecast and Media Weather Reports. L.Lemus-Deschamps, P. Gies, L. Rikus, K. Strong and H. Dixon. Proceedings of the Workshop “UV Radiation and its Effects: an update (2006)” Dunedin, April 19-21, 2006.

Services

Personal Radiation Monitoring Service (PRMS)

The ARPANSA PRMS has 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 Application Development Project is continuing and is expected to be implemented by September 2006. Formal Acceptance Testing is due to begin in July 2006 and the production cut-over date to the new system is expected to be between 1 to 4 September 2006.

A redesigned prototype of the new monitor holder to be used in the PRMS has been developed and should be ready for testing in August 2006. A new design for the hologram to appear on the front of the holder is being developed. The project is expected to be completed within the next 6 months.

Ionizing Radiation Standards (IRS) – Calibration Services

An internal audit of the IRS calibration services occurred in early May, 2006 focussing on the therapy calibration procedures. Corrective actions were made and the documentation finalised for the NATA reassessment and the extension of scope of the IRC accreditation in June, 2006. This external audit was carried out over two days in late June (28-29) with the provisional confirmation of the existing accreditation and the agreed extension of scope expanded to include Caesium-137 radiation services.

The implementation of the 24 hour a day supplementary air-conditioning system in the IRS work area has contributed to the redevelopment of the ARPANSA graphite calorimeter. Electrical balance has been reached for the core and isolating jackets.

Heater calibration and optimisation of thermal drift is being carried out, with the likelihood that exposure to radiation can be undertaken within the next few weeks.

The Australian Nuclear Science and Technology Organisation (ANSTO) has officially notified ARPANSA that it will not be able to supply the IRS Section with a replacement Cobalt-60 source. Discussions have been initiated with alternative overseas suppliers, including MDS Nordion, Canada, in order to resolve refurbishment options.

On April 29, ARPANSA participated in the Queensland hospital dosimetry audit day at the Mater Centre in Brisbane. Representatives from the IRS Section and five radiotherapy centres in Queensland used their secondary standards dosimeters to measure the output of a clinical linear accelerator at 6 and 10 MV. The largest difference between measurements was 0.9% and the standard deviation of all the measurements was 0.3% for both beams.

In a similar exercise IRS staff visited the Bendigo Radiotherapy Centre on 24 May to perform TLD exposures as part of the preparations towards the recommencement of the national TLD audit program. The visit also provided an independent quality assurance check of the dosimetry being performed at Bendigo. The secondary goal was to determine the influence of different configurations of the TLD holder on the dose delivered to the TLD, in order to establish correction factors for varying lengths of PMMA tubing in the beam preceding the TLD position.

On Friday May 19, representatives from ARPANSA and ANSTO attended a meeting at the National Measurement Institute (NMI) to discuss measurement standard authorisations and Verifying Authority issues. ARPANSA's Verifying Authority status depends on the outcome of the accreditation audit.

Statistics on the outputs of ARPANSA's services are at Appendix B.

National leadership in radiation protection and nuclear safety

National Uniformity

Drafting of the second edition of the National Directory for Radiation Protection continued following comments on the document from Radiation Health Committee members. It is intended that the draft will be approved by the Committee's Business Working Group and a regulatory impact statement developed during the next quarter.

Comprehensive Test Ban Treaty – air sampling monitoring systems

As part of Australia's commitment to the Comprehensive Test Ban Treaty, ARPANSA continued to operate and maintain radionuclide air monitoring stations at Melbourne, Perth, Townsville, Darwin, Cocos Islands, Australia, and Kavieng in PNG. ARPANSA continues to liaise with Commonwealth agencies for the establishment of further radionuclide monitoring stations on Macquarie Island and the Antarctic mainland.

In addition to operating the stations, ARPANSA also operates the Australian Radionuclide Laboratory, which has the role of testing samples obtained by other monitoring stations. The laboratory is currently non-functional pending the delivery

of a new HPGe detector which will be expected to meet the Comprehensive Test Ban Treaty Organisation certification specifications.

ARPANSA continues to maintain a National Data Centre that provides advice to the Australian Safeguards and Non-Proliferation Office (ASNO) on any event detected by the CTBT radionuclide network that may be indicative of a nuclear weapon test explosion.

Radiation Emergency Planning

The HPS provided a radiation expert for the Crisis Advisory Panel of Experts and through the Radiation Emergency Operations Unit (EOU) maintained a 24 hour radiation emergency duty officer to provide 24 hour access to ARPANSA resources and expertise.

In April 2006:

- the EOU participated in a Proliferation Security Initiative activity, EXERCISE PACIFIC PROTECTOR 06, with participants from Australia, United States, Singapore, Japan and the United Kingdom. EXERCISE PACIFIC PROTECTOR involved the interception and recovery of weapons of mass destruction related material;
- HPS participated in a meeting of the Visiting Ships Panel (Nuclear) to provide expert advice on radiation protection and health physics issues, as part of the Australian planning to allow visits by nuclear powered warships;
- HPS produced and delivered lectures on radiation emergency radiation protection framework for the NSW Emergency Service Organisation training at ANSTO;
- HPS represented ARPANSA at the International Conference "Twenty years after Chernobyl accident. Future Outlook" held in Kiev, Ukraine on the occasion of the 20th anniversary of the Chernobyl accident;
- HPS represented ARPANSA at the 11th Coordination Meeting of the WHO Collaborating Centres in Radiation Emergency Medical Preparedness and Assistance Network (REMPAN) at the National Research Centre for Radiation Medicine, Kiev, Ukraine;
- HPS represented Australia at the Consequence Management Group meeting, hosted by the UK Home Office as part of the AUSCANUKUS Quadrilaterals, to provide expert advice on radiation protection and health physics issues as part Australia planning for radiological terrorism.

In June, 2006:

- EOU conducted a practical exercise with South Australian EPA, Radiation Protection Division. The exercise involved deploying by road to Adelaide and conducting mapping and live source location and identification training.
- HPS participated in a meeting of the Technical Working Group of the Visiting Ships Panel(Nuclear) to revise the Australian manual covering arrangements that allow visits to Australian ports by nuclear powered warships (OPSMAN1).
- HPS represented ARPANSA at the International Workshop on the INEX 3 Consequence Management Exercises, organized by the OECD Nuclear Energy Agency, held in Paris, France. The INEX 3 is a series of national level tabletop

exercises that have focused on the response to widespread radiological contamination of the environment and the relevant issues in the medium to longer term period after such an event.

Commonwealth radioactive waste holdings

A draft ARPANSA report has been prepared of Commonwealth radioactive waste holdings. This report has been produced to assist in the planning stages of the proposed Commonwealth Radioactive Waste Management Facility in the Northern Territory.

International Activities

Non-ionising Radiation

After 10 years of work, Committee TC 6-29, Chaired by Dr Peter Gies (ARPANSA) finalised and published report CIE 172:2006 entitled “UV Protection and Clothing” for the CIE (Commission Internationale de L’Eclairage or the International Lighting Commission).

A senior ARPANSA staff member presented three papers at the annual meeting of the International Advisory Committee of the World Health Organization’s International EMF Project. The meeting was held in Geneva on 7-9 June 2006. On 27-29 June the staff member met with Alastair McKinlay at the Health Protection Agency in Oxford, UK to finalise the draft booklet on Wireless Communications (including WLANs) for WHO.

Regulation and Policy

ARPANSA hosted officials from the government of Cambodia including members of the radiation and nuclear safety regulator as part of the Australian Government’s efforts to enhance the safety and security of radioactive material.

Development of International Safety Standards

Mr Alan Melbourne represented Australia at the IAEA Radiation Safety Standards Committee (RASSC) meeting in Vienna from 3 April – 7 April 2006. The meeting discussed the review of the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* and the development of publications in the IAEA Safety Standards series.

Dr Geoff Williams represented Australia at the 21st meeting of the IAEA Waste Safety Standards Committee in Vienna, 3-7 April. A number of draft safety standards were approved at the meeting, including *DS298: Safety Fundamentals: Principles of Nuclear, Radiation, Radioactive Waste and Transport Safety*, *DS172: Safety Guide: Implementation of the Remediation Process for Past Activities and Practices*, *DS354: Safety Requirements: Disposal of Radioactive Waste*, and *DS390: Safety Guide: Classification of Radioactive Waste*. The last two were approved to go to Member States for comment, with DS390 to be modified in response to the comments from Australia that further consideration should be given to defining “high level” waste in terms of both activity levels and heat generating capacity.

The need for revision of the BSS was discussed at the WASSC meeting. It was determined “that there is a case for a revision of the BSS to be undertaken at a measured pace, ensuring adequate time for analysis, especially of the benefits and drawbacks of proposed changes, and for resolution of issues and careful drafting and

review of text, recognizing the need to retain its comprehensive character. The process should fully involve the current and potential cosponsors of the BSS and all of the IAEA Safety Standards Committees.”

Environmental Modelling for Radiation Safety

Dr Rick O’Brien of ARPANSA chaired a meeting of the IAEA Environmental Modelling for Radiation Safety working group on naturally occurring radioactive material at the University of Cyprus in Nicosia from April 25th to April 29th. The aim of this project is to develop and test models for environmental assessment.

Regulation

Correction of matters raised in March 2006 Quarterly Report of the CEO

In the March 2006 Quarterly Report of the CEO of ARPANSA it was reported that the Australian Nuclear Science and Technology Organisation (ANSTO) had breached their licence conditions in relation to Facility Licence FO044-8A Actinide Suite and Materials Fabrication Bay and in relation to Facility Licence FO044-5Cc Gamma Irradiator Suite. This information was incorrect. The CEO of ARPANSA did not find ANSTO in breach of licence condition in relation to either licence.

ARPANSA Response to the ANAO Audit No 30: Regulation of Commonwealth Radiation and Nuclear Activities

ARPANSA continued to implement the recommendation of the Australian National Audit Office (ANAO) during the quarter. The CEO of ARPANSA established a new organisational structure for the management of regulation. This structure consists of Regulation and Policy Branch headed by a Director Regulation and Policy who is responsible for the management of the pathway of all regulatory matters and advising the CEO of ARPANSA on his regulatory functions.

Major Licensing Activities

ANSTO – OPAL Research Reactor – Application for an Operating Licence (F0157)

During the second quarter of 2006 ARPANSA received a significant amount of documentation from ANSTO in support of its application to operate the OPAL reactor. This assessment, at the same time as significant activities were undertaken in relation to the monitoring of compliance with the construction licence (see below) placed a heavy demand on ARPANSA resources during the quarter.

The principle areas of review and inspection were in relation to Plans and Arrangements, the Safety Analysis Report; Operational Limits and Conditions and the Probabilistic Safety Assessment for the OPAL Reactor.

ARPANSA officers are currently assessing the application and preparing reports to the CEO advising as to the adequacy of the application to operate the OPAL reactor

Major Licensing Activities

ANSTO – OPAL Research Reactor – Construction Licence (F0118)

ARPANSA received ANSTO's quarterly report of compliance with the licence authorising construction of the OPAL reactor for the March quarter on 5 April 2006. This report dealt with Quality Assurance issues, compliance with construction license conditions and design changes which were necessary as a result of the detailed engineering of the facility. The ANSTO report showed that the majority of the pre-commissioning system tests had been completed. The remainder were to be undertaken during stage A reactor commissioning (cold commissioning). At the end of the second quarter, all stage A commissioning activities had been completed and ANSTO submitted a report on Construction confirming this on May 2006.

ANSTO – HIFAR Research Reactor – (F044-4A)

HIFAR continued to operate safely during the quarter. ARPANSA continued to require reassurance from ANSTO in relation to the staffing of HIFAR during this period. ANSTO reported six new reactor operators in training, two of them in advanced stages prior to accreditation. ANSTO reported that they intend recruiting four more operator trainees. The current staffing levels are within the HIFAR Operating Limits and Conditions.

ANSTO continues to undertake systems upgrades for the HIFAR reactor. HIFAR has a total of 27 plant modification projects ongoing. During this quarter three changes were reported at practical completion, four at final completion and three new projects were initiated. Many of the HIFAR modifications result from parts and components being unavailable due to the age of the reactor design. As the replacements are not usually of the same characteristics and parameters as original items their installation needs to be assessed. The handling by ANSTO of these modifications is under assessment by ARPANSA.

Details of Regulatory Activities, including the inspection program

Further details of regulatory activities including a list of all licensed facilities, installations and sources are at Annex A.

Report on the operations of the Radiation Health and Safety Advisory Council, the Radiation Health Committee and the Nuclear Safety Committee (para 60(1)(c) of the ARPANS Act 1998)

Radiation Health and Safety Advisory Council

The Council met on 28 April 2006 at ARPANSA's Miranda office. A summary of the meeting is available at http://www.arpansa.gov.au/rhsac_mt.htm.

At the meeting the Council considered the following matters:

- The draft report to the CEO, giving advice on emerging medical radiation protection issues. The advice was completed out of session taking into account comment from members and forwarded to the CEO on 29 May, 2006.
- Recent developments in the drafting of the ELF Standard. The draft had recently been reviewed by the ELF Consultative Group and a revised version discussed at the March 2006 RHC meeting. Council noted that a full regulatory impact statement (RIS) was to be prepared, examining the options of publishing a regulatory Standard, publishing a non-regulatory Standard with educational strategies for the leukaemia issue, and not publishing a Standard.
- The recent publication by the Chernobyl Forum: 2003-2005, which reviewed the legacy of health effects from the Chernobyl reactor accident after 20 years. The figures projected that about 10,000 cancer deaths would occur in the above groups. Council was also advised that the International Agency for Research on Cancer (IARC), part of the World Health Organisation, recently reviewed the potential cancer burden in Europe from the Chernobyl accident. That report concluded that there could be 16,000 resulting cancer deaths in the European population of 570 million over the next 80 years (i.e. about 0.01% of all cancer deaths).
- ARPANSA's work and international developments in relation to the security of sources. Council was informed of the background and content of the National Source Security Strategy, which includes provision for a Code of Practice for the Security of Sources, currently being prepared. The Code provides a method for categorizing sources and then requires a risk assessment and security plan to be prepared. Other Australian and international developments in this area were also discussed.
- The CEO briefed Council on the remaining processes and issues required to finalise consideration of the operating licence application for the OPAL Reactor.
- Council also discussed reports from the CEO on ARPANSA activities, and reports from the Radiation Health Committee and Nuclear Safety Committee.
- Council also met representatives of NSW Department of Environment and Conservation for a discussion on current radiation protection arrangements in NSW.

Radiation Health Committee

The Committee did not meet during the quarter. The Committee's next meeting is scheduled for 19 and 20 July 2006.

Nuclear Safety Committee

The NSC met on 16 June 2006. A summary of the meeting is available at http://www.arpansa.gov.au/nsc_mt.htm.

The Committee was briefed by ANSTO and INVAP on the cold commissioning of the OPAL Research Reactor, which was completed during May 2006. The Committee had been provided with the ANSTO report on cold commissioning and was afforded

the opportunity to clarify any outstanding issues with the staff from ANSTO and INVAP. The Committee advised the CEO that the cold commissioning appeared to have been adequately handled.

Members were also briefed on human factors aspects relating to the OPAL Reactor control room and the current state of the ARPANSA assessment of the licence application.

Reports on ARPANSA, Council and RHC activities were also discussed.

Reports required by subsections 60 (2)-(5) of the Act

Details of directions given by the Minister under Section 16

No directions were given by the Minister under Section 16 of the Act during the quarter.

Details of any breach of licence conditions by a licensee during the quarter, of which the CEO is aware

Breaches determined by the CEO

Breach of the ARPANS Act

ANSTO Facility Licence FO118

On 16 March 2006, the CEO of ARPANSA wrote to ANSTO asking that they remove Hoist C from the Reactor Hall Crane which is part of the OPAL Reactor Facility. The manufacture and installation of the hoist had been undertaken without receipt of the relevant approvals from the CEO of ARPANSA and was in breach of Regulation 51 of the ARPANS Regulations. The breach was rectified by ANSTO outside of this quarter, on 20 June 2006, by the removal of the Hoist from the Reactor Hall Crane by ANSTO. As a consequence of this rectification of the breach the CEO decided that he would not undertake any enforcement activity in relation to the breach.

CSIRO Industrial Physics S0105 – Breach of regulation 51

The licence holder was notified on 23 June 2006 of a breach of regulation 51. This was considered to be largely due to an administrative oversight. The breach related to the operation of controlled apparatus (optical fibre communication systems), at the Canberra Deep Space Communication Complex, of a kind not authorised by the source licence issued to that division. (CSIRO is authorised to deal with this kind of controlled apparatus but in a different division and under a different source licence). With the notification to CSIRO, information was provided to assist them in rectifying the breach by making an application for approval of a (regulation 51) 'relevant change with significant implications for safety'.

On 28 August 2006, an application for approval of a relevant change was submitted. This application was approved and an amended source licence issued on 24 October 2006.

Reports to the CEO from the RHSAC and NSC (paragraphs 20(f) and 26(1)(d) of the Act)

A list of all facilities licensed under Part 5 of the *ARPANS Act*

Appendix A contains:

- details of licence applications received during the quarter;
- details of all licences issued, amended or surrendered during the quarter; and
- an overview of the compliance program; and
- a list of all facilities licensed under Part 5 of the ARPANS Act including quarterly reporting status.

Annex A

Licence applications received during the quarter:

Type of application	From
Source licence application seeking authorisation to deal with controlled apparatus	Bragg Institute, Australian Nuclear Science and Technology Organisation (ANSTO)
Source licence application seeking authorisation to deal with ...	Australian Communications and Media Authority (ACMA)
Source licence application seeking authorisation to deal with ...	Royal Australian Mint
Source licence application seeking authorisation to deal with ...	Decipha Pty Ltd (a wholly owned subsidiary of Australian Postal Corporation)

Licences issued, amended or surrendered during the quarter:

Type of licence and authorisation	To
Source – amendment of licence (S0005)	Bureau of Meteorology
Source – amendment of licence (S0040)	Family Court of Australia
Facility – amendment of licence (F0046)	ARPANSA Medical Radiation Branch
Source – amendment of licence (S0092)	Australian Customs Service
Source – amendment of licence (S0129)	Australian Securities and Investments Commission
Source – amendment of licence (S0151)	Attorney-General's Department
Facility – amendment of licence (F0131)	Australian Customs Service Melbourne Container Examination Facility
Facility – amendment of licence (F0044-8A)	ANSTO – Actinide Suite
Facility – amendment of licence (F0044-8B)	ANSTO – Materials Fabrication Bay
Facility – issue of licence (F0166)	Department of Defence – Port Wakefield linear accelerator, South Australia

Compliance Monitoring

The major compliance monitoring activities undertaken during the quarter were planned inspections and the receipt from licence holders of their quarterly reports.

Inspections for compliance monitoring

ARPANSA continues an active program of inspections to determine compliance with licences issued under the *ARPANS Act 1998*. The following inspections were undertaken in the quarter:

- Department of Environment and Heritage - Parks Australia North
- Department of Environment and Heritage - Supervising Scientist Division
- ANSTO – Ore Processing and Operations Facility
- ANSTO – Minerals Division
- Australian National University
- National Gallery of Australia
- Geoscience Australia
- Geoscience Australia – Geospatial and Earth Monitoring Division
- Department of Defence - Clearance Dive Team 4, HMAS Stirling
- Department of Defence - HMAS Arunta
- Department of Defence - Medical X-ray Department, HMAS Stirling
- Department of Defence - Joint Logistics Unit West, Explosive Ordnance Disposal, HMAS Stirling
- Department of Defence - 79 Squadron, RAAF Pearce
- Department of Defence - Dental Department, RAAF Pearce
- Department of Defence - Explosive Ordnance Disposal, RAAF Pearce
- Department of Defence - Special Air Services Regiment, Campbell Barracks
- Australian Quarantine and Inspection Services (AQIS) – Sydney Gateway Facility
- ANSTO OPAL Reactor - Construction
- ANSTO HIFAR Research Reactor
- ANSTO MOATA Research Reactor
- ANSTO Australian Radiopharmaceuticals Industries

Inspections of non-licence holders

- Royal Australian Mint

Facilities licensed under Part 5 of the ARPANS Act including summary of licence holder quarterly report

Licence ¹	Licence Holder	Date of receipt of quarterly report	Summary of Licence Holder's Quarterly Report
Australian Nuclear Science and Technology Organisation			
F0118	OPAL Reactor (Construction)	28/04/2006	Ongoing review of compliance with licence conditions.
F0044-4A	HIFAR Research Reactor	27/04/2006	Inspection conducted, no non-compliances identified.
F0044-4B	Waste Operations & Technology Development	24/04/2006	No change.
F0044-4C	Fuel Storage & Handling	24/04/2006	Relevant change approved and licence amended.
F0044-5A, 5B, 5C	Australian Radiopharmaceuticals and Industrials	01/05/2006 A 01/05/2006 B 03/05/2006 C	Concept design for fission product plant agreed. Inspection conducted at the ARI nuclear installations; no non-compliances identified.
F0044-5Cc	Gamma Irradiator Suite	28/04/2006	No change.
F0044-6A	Moata Research Reactor (Decommissioning)	22/04/2006	Inspection conducted, no non-compliances identified.
F0044-6Ba	ANTARES Accelerator	28/04/2006	No change.
F0044-6Bb	Van de Graff Accelerator	28/04/2006	No change.
F0044-6C	GATRI Irradiator	01/05/2006	Completed improvements based on recommendation set out in Gammacell Safety Assessment Report.
F0044-6D	Secondary Standards Dosimetry Laboratory	28/04/2006	No change.

F0044-7A	Ore Processing Facility	11/04/2006	Inventory of controlled material updated.
F0044-7B	Radiotracer Storage Facility	28/04/2006	Change of nominee. Plans and arrangements updated.
F0044-8A	Actinide Suite	26/04/2006	Airborne discharges less than 1% of notification levels.
F0044-8B	Materials Fabrication Bay	28/04/2006	Arrangements for access to materials store reviewed and updated. New database for material inventory being trailed.
F0134	STAR Accelerator	28/04/2006	No change.
S0045	ANSTO Institute for Environmental Research (IER)	28/04/2006	Procedure for safe use of lasers being developed. Sealed Source inventory updated. Unsealed Source inventory updated. No studies using environmental tracers offsite. SAC1552 submitted to SAC for approval. Local procedures and instructions reviewed and updated. Temporary transfer of Cs-137 source to UNSW under SAC1689. Name changed from Nuclear Geophysiology to Institute for Environmental Research (IER).
	ANSTO Materials and Engineering Science	28/04/2006	SAC renewal approvals awaiting approval for induction heaters.
	ANSTO Engineering Services	31/03/2006	Door control and interlock system checked.
	ANSTO Minerals	20/04/2006	Local forms reviewed and updated.
	ANSTO Safety & Radiation Science	01/05/2006	No change.
	Bragg Institute	22/04/2006	Radiation survey confirmed modification of SAXS machine did not increase radiation levels.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)			
F0046	Linear Accelerator and Teletherapy Laboratory	10/04/2006	Compliance with conditions of licence reviewed and documented.
S0002	Environmental & Radiation Health Branch	28/04/2006	Four sources added to inventory.
S0003	Medical Radiation Branch	28/04/2006	No change.
S0051	Non-ionizing Radiation Branch	28/04/2006	No change.
Australian National University			
F0074	Accelerators	08/05/2006	Operating Procedures for the 14UD Accelerator updated.
S0027	Faculty of Engineering & Information Technology	05/04/2006	No inventory change.
	Human Resources	05/04/2006	Radioactive sources were relocated to the new OH&S building.
	John Curtin School of Medical Research	05/04/2006	A minor exposure of eyes to UV radiation investigation. Unexpected dose reading investigation.
	Research School of Astronomy & Astrophysics	05/04/2006	Some lasers moved into storage.
	Research School of Biological Sciences	05/04/2006	UV apparatus inventory updated.
	Research School of Earth Sciences	05/04/2006	Change in nominee.
	Research School of Pacific & Asian Studies	05/04/2006	No change.
	Research School of Physical Sciences &	05/04/2006	Seal source inventory updated.

	Engineering		
	Faculty of Science	05/04/2006	Electron capture detector source in portable gas chromatograph added to source inventory.
	Research School of Chemistry	05/04/2006	No change.
	School of Art	05/04/2006	No change.
Commonwealth Scientific and Industrial Research Organisation (CSIRO)			
F0060	Heavy Ion Accelerator Facility	Not received	
F0137	Neutron Generator Facility	10/04/2006	Annual review of HSE Assessment and Control of Work (SAC 1243) completed, with no changes.
S0009	Land and Water	03/05/2006	New Divisional RSO. Changes to source inventory.
S0010	Textile and Fibre Technology	26/04/2006	Provision of training, in response to inspection findings, still to be finalised.
S0013	Corporate Property	31/03/2006	No change.
S0016	Molecular and Health Technologies	27/04/2006	Minor alterations to source inventory. New site safety manual written for Parkville.
S0017	Entomology	24/04/2006	Increase in holdings of unsealed controlled material. Revised radiation supplements being completed as part of annual review of safety assessments.
S0018	Sustainable Ecosystems	28/04/2006	No change.
S0019	Marine and Atmospheric Research	09/05/2006	Confirmation of approved disposal of four sealed sources. No other changes.
S0021	Plant Industry	27/04/2006	Minor changes to source inventory. Two new site Radiation Safety Officers appointed.
S0022	Livestock Industries	28/04/2006 05/05/2006	No change.
S0023	Food Science Australia	12/05/2006	No change.

S0025	Energy Technology	27/04/2006	Approval received to deal with UV controlled apparatus. Minor corrections to source inventory.
S0030	Petroleum Resources	24/04/2006	No change.
S0038	Human Nutrition	27/04/2006	Change of Nominee.
S0054	Forestry and Forest Products	01/05/2006	Minor amendment to source inventory.
S0061	Exploration & Mining	01/05/2006	No change.
S0064	Minerals	10/04/2006	Waste audit completed. Annual review of HSE Assessment and Control of Work completed for ionising apparatus. Minor changes to source inventory. Arrangements have been made for update of Radiation Safety Manual. All other actions resulting from inspection of Clayton site have been completed.
S0066	Manufacturing and Infrastructure Technology	27/04/2006	Minor changes to source inventory.
S0105	Industrial Physics	21/04/2006	Two new RSOs appointed. Several additions to the source inventory.
S0130	Australia Telescope National Facility	27/04/2006	Additions to inventory.
Department of Defence			
F0084	Woomera Storage Facility	09/05/2006	No change.
F0113	Bandiana Storage Facility	09/05/2006	Radon canisters removed and sent to ARPANSA Yallambie for analysis. However no analysis received at time of quarterly report dated 13 April 2006. Review of P&A to commence May 06. However in quarterly report for period ending 31/12/05 commencement date was stated as March 06. No inventory changes have been declared in quarterly reports since the licence was issued.

F0116	RADIAC Calibration Facility	09/05/2006	<p>Tender process finalised for RADIAC clean room upgrade.</p> <p>Review of P&A to commence May 06. However in quarterly report for period ending 31/12/05 commencement date was stated as March 06.</p>
F0117	Salisbury Storage Facility	09/05/2006	<p>Options for gas build up in drums resolution being investigated. Annual facility audits being organised. However no fixed dates for completion.</p>
S0042	Aust Defence Organisation	09/05/2006	<p>UV incidents reported from Mercury Vapour Lamps. ARPANSA has responded to the issue.</p> <p>Full inventory to be provided on CD - no date specified.</p>
Australian Customs Service			
F0125	Matraville Container Examination Facility	27/04/2006	<p>Radiation Safety Management Plan (RSMP) currently being reviewed into a national document.</p> <p>New radiation safety advisers were appointed by Customs.</p>
F0131	Melbourne Container Examination Facility	27/04/2006	<p>Radiation Safety Management Plan (RSMP) currently being reviewed into a national document.</p> <p>New radiation safety advisers were appointed by Customs.</p>
F0136	Fisherman Island Container Examination Facility	27/04/2006	<p>Radiation Safety Management Plan (RSMP) currently being reviewed into a national document.</p> <p>New radiation safety advisers were appointed by Customs.</p>
F0155	Fremantle Container Examination Facility	27/04/2006	<p>Radiation Safety Management Plan (RSMP) currently being reviewed into a national document.</p> <p>New radiation safety advisers were appointed by Customs.</p>
F0156	Osborne Container Examination Facility	27/04/2006	<p>Radiation Safety Management Plan (RSMP) currently being reviewed into a national document.</p> <p>New radiation safety advisers were appointed by Customs.</p>

F0162	Brisbane Airport Neutron Scanner - Operate	26/04/2006	Australian Customs Service have reported a potential breach as the cooling water used within the facility was replaced and the waste water diluted and disposed of via the sewage system by CSIRO. Radiation monitoring around the facility was completed in mid-January, a report on the radiation survey monitoring programme is being finalised.
S0092	Australian Customs Service Sources	13/04/2006	Minor changes to the source inventory.

Single Licence Holders

F0043	Dept of Education Science and Training – Maralinga	19/04/2006	Plans and arrangements reviewed 1 November 2005 with no changes recorded. A water table sample report is currently being prepared and will be forwarded to ARPANSA when complete.
F0093	Parks Australia North	09/05/2006	No change.
S0005	Bureau of Meteorology - Cape Grim	29/03/2006	Annual review of plans and arrangements, January 2006, as part of waste audit for ARPANSA.
S0007	Aust Institute of Marine Science	3/04/2006	Change of RSO. Audit of sources including waste audit for ARPANSA requirements. Some changes to inventory.
S0008	Australian Antarctic Polar Medicine	28/04/2006	No change.
S0012	Dept of Prime Minister & Cabinet	31/03/2006	No change.
S0014	Dept of Industry, Tourism & Resources - Geoscience Australia	26/04/2006	Source Licence was amended to allow the use of the portable XRF and Cs137 Core Logger. Plans and Arrangements reviewed, no updates required. Portable XRF transported to Bourke to perform field measurements.
S0015	Supervising Scientist	06/04/2006	No change.
S0020	Dept of Transport & Regional Services	03/04/2006	No change.
S0024	National Gallery of Australia	28/04/2006	RSO attended radiation safety course. Annual safety check of x-ray facility completed. Annual review of plans and arrangements completed.

S0031	National Capital Authority	28/04/2006	No change.
S0033	Note Printing Australia	11/04/2006	No change.
S0034	Australian Crime Commission	24/04/2006	<p>The licence holder is reviewing the Brisbane office maintenance contract. The plans and arrangements will be reviewed in the middle of 2006.</p> <p>A report from ARPANSA's monitoring service was received during the last quarter. The matter involved the x-ray unit at the Brisbane office. The licence holder conducted an investigation which concluded that the control badge was inadvertently allowed to pass through the x-ray unit. The licence holder has undertaken steps to correct the incoming mailing procedure at the Brisbane office.</p>
S0036	Federal Court of Australia	17/05/2006	No change.
S0040	Family Court of Australia	15/05/2006	<p>Five new x-ray inspection units installed at the Adelaide, Wollongong, Hobart, Melbourne and Canberra offices.</p> <p>Six x-ray baggage unit disposal requests approved.</p> <p>Safe Passage Training provided in January 2006 by Chubb and Wilson Security.</p>
S0047	Dept of Industry, Tourism & Resources - Geoscience Australia – Geospatial & Earth Monitoring Division	08/05/2006	No change.
S0052	Dept of Parliamentary Services	23/05/2006	No change.
S0055	Dept of Environment & Heritage Aust Antarctic Division	28/04/2006	Updated information on use of unsealed sources, laser operations and training.

S0056	Australian Federal Police	28/04/2006	<p>Two baggage inspection x-ray units have been disposed. Various controlled apparatuses have been relocated with the source inventory updated accordingly.</p> <p>National Guideline on Radiation Safety has been reviewed and will be submitted to the AFP National OH&S Committee for endorsement.</p> <p>The plans and arrangements for a security device have been reviewed. These plans will be provided to ARPANSA in May 2006.</p>
S0077	National Museum of Australia	04/04/2006	Minor change to source inventory.
S0079	Dept of Foreign Affairs & Trade	10/04/2006	Eleven baggage x-rays were added to the source inventory during the quarter.
S0080	Australian War Memorial	28/04/2006	Minor changes to source inventory.
S0090	Silex Systems Ltd	31/05/2006	Anticipate possible need for licence amendment as a result of organisational changes.
S0120	Department of Agriculture, Fisheries & Forests - Australian Quarantine and Inspection Service	24/04/2006	Minor changes to Source Inventory. Update of plans and arrangements are being finalised.
S0127	Telstra		Licence Surrendered.
S0129	Australian Securities & Investments Commission	04/04/2006	Radiation Safety Awareness Training course completed and reviewed by Regulation and Policy. Radiation safety awareness training was provided to 38 staff members.
S0135	Dept of Immigration, Multicultural & Indigenous Affairs	15/05/2006	Minor changes to the source inventory and the disposal of controlled apparatus.
S0142	National Measurement Institute	28/04/2006	Three sealed sources added to the source inventory. These sealed sources were removed from smoke detectors and are packed into storage containers pending disposal.
S0150	Australian Postal Corporation	12/04/2006	No changes.

S0151	Attorney-General's Department	21/04/2004	The licence holder reviewed their plans and arrangements in March 2006.
S0165	Law Courts Limited	09/05/2006	No change.

Note 1 'F' indicates Facility Licence and 'S' indicates a Source Licence

Note 2 'No change' in relation to a Source Licence or Facility Licence means that during the quarter:

- no breach of licence conditions was reported under regulation 45
- no accident was reported under regulation 46
- no relevant change was reported under regulation 52
- no transfer or disposal of controlled material or controlled apparatus was reported under regulation 53
- no change to the inventory of controlled material or controlled apparatus was reported

Annex B – Service Operations

B.1 The Radiofrequency Calibration Laboratory

Calibration requests	Jobs completed as NATA accredited reports	Job composition
83	72	48 monitors (with 53 probes) 28 personal monitors

B.2 Ultraviolet Protection Factor Testing, Licensing and Labelling

Job requests	Fabric tested samples	UPF trademark licenses completed	UPF swing tags issued	Pairs of sunglasses tested
174	674	40	1,851,500	None

B.3 Radioanalytical Service

Water	Food	Soil/Sediment	Filter	Wipe test
198	25	2	63	19

Maypacks	Biota	Other		
34	37	7		

B.4 Dosimetry Calibration Services

Therapy reference doseimeters	Standard ionization chambers	Gamma survey meters	Neutron survey meters	Personal dosimeters	Reference beams from sources or generators	Jobs in progress
2 (2 Hospitals)	4	2	3	0	0	2

B.5 Import Permits issued under Customs (Prohibited Import) Regulations 1956 – Medical Radioisotopes

Total permits issued	Single-shipment permits issued	12-monthly permits issued	Permits issued urgently
88	73	11	4

B.5 Import Permits issued under Customs (Prohibited Import) Regulations 1956 – Medical Radioisotopes

Total permits issued	Single-shipment permits issued	12-monthly permits issued	Permits issued urgently
88	73	11	4

B.6 Import Permits issued under Customs (Prohibited Import) Regulations 1956 – Non- Medical Radioisotopes

Total permits issued	Single-shipment permits issued	12-monthly permits issued	Permits issued urgently
133	124	9	73

B.7 Export Permits under Customs (Prohibited Export) Regulations 1958

Total Permits Issued	1
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