



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

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

FOR THE PERIOD 1 OCTOBER 2007 TO 31 DECEMBER 2007



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and Nuclear Safety Agency**

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ISSN 1443 - 654X

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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.

Printed by:

CanPrint Communications Pty Ltd
16 Nyrang Street
Fyshwick ACT 2609

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Letter of Transmittal

21 February 2008

Senator the Hon Jan McLucas
Parliamentary Secretary to the Minister
for Health and Ageing
Parliament House
Canberra ACT 2600

Dear Parliamentary Secretary

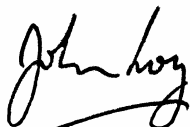
The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- 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 all 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 October 2007 to 31 December 2007.

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

The report on the operations of the CEO and ARPANSA is based on the agency's three output groups:

- knowledge, information and services;
- national leadership in radiation protection and nuclear safety; and
- regulation.

Knowledge, information and services

Non-ionizing radiation

ULTRAVIOLET RADIATION (UVR)

ARPANSA organised a National Forum on Solaria in Melbourne on 20 November 2007. ARPANSA officers gave two presentations to the Forum. A report commissioned by ARPANSA from the Queensland Institute of Medical Research on the health impacts assessment of regulating solaria was also presented at the Forum and subsequently to the Radiation Health Committee. The Forum prepared a draft national position on regulation of solaria to be considered by the Radiation health Committee in the first instance.

As part of their undertakings to the Standards Australia Committee on Solaria CS64, ARPANSA officers visited a number of solaria in Melbourne and Sydney to make spectral measurements of sunbed emissions. The data will be presented to CS64 Committee and will also be used in subsequent publications looking at the impact of solaria on public health.

ARPANSA officers attended LabCon 2007 held on 30 November 2007 at Monash University and gave a presentation titled: "ARPANSA and UV Radiation". An ARPANSA officer also participated in the 5th International Conference on "Reducing the Health Risks of Sunbed Use – Needs for further European Harmonization of Regulations" in Hamburg on 15 - 17 October 2007.

ARPANSA officers visited the Australian Antarctic Division in Kingston to give a presentation on Solar UVR and provided technical and scientific support to the Department of Health and Human Services, Health Physics Unit in Hobart related to the use of their new Ocean Optics Diode Array in the measurements of solaria sunbeds.

A manuscript covering the pilot study of UVR exposures of parents, children and lifeguards, done in collaboration with the University of Hawaii and Emory University in the US, has been accepted for publication in *Photochemistry and Photobiology*. Another paper looking at the occupational UVR exposures of lifeguards, has been drafted for submission to a scientific journal.

ARPANSA has been providing real time UVR measurement data on the internet for Melbourne, Sydney, Darwin, Adelaide, Brisbane, Townsville, Newcastle and Kingston (outside Hobart). This quarter that service was expanded to include Perth. Plans are underway to add Alice Springs to the data during 2008.

Enquiries were received regarding measured UVR data from the AusImmune study, from the Victoria Police for UV Index data for Melbourne and members the public regarding UV levels and Vitamin D.

ARPANSA UPF swing tags, which identify the UPF rating of fabrics to which they are attached, have been redesigned to include details of ARPANSA related activities and information.

ELECTROMAGNETIC RADIATION (EMR)

Following concern about a possible cluster of cases of breast cancer among workers at a hospital in Sydney, scientific officers from the Electromagnetic Radiation Section carried out measurement of Extremely Low Frequency (ELF) magnetic fields and Radiofrequency (RF) electromagnetic radiation (EMR) in offices, wards and grounds of the hospital. Subsequently the results of the measurements were published on behalf of the hospital.

Meetings of the working group preparing the Standard on Exposure to Extremely Low Frequency Electric and Magnetic fields were held at APRANSA on 18 and 19 October 2007 and 19 December 2007. The meetings continued consideration of the public submissions received following the release of a draft Standard for public consultation. Further meetings are planned.

ARPANSA officers continued to provide information to state and Australian government agencies and to the public and media regarding EMR and health. In a continuing trend, most enquires were in regard to the possible health effects of magnetic fields from electricity distribution, particularly high-voltage transmission lines and sub-stations or transformers. Inquiries about wireless technologies, primarily mobile phone base stations, were also numerous. Other calls concerned microwave ovens, satellite dishes and occupational exposures to radio installations.

ARPANSA officers took part in the annual conference of the Australasian Radiation Protection Society in Brisbane on 21 - 26 October. The CEO gave the keynote opening address to the conference ARPANSA officers made the following presentations:

- “Electromagnetic Radiation Levels from Mobile Phone Base Stations – Attenuated Levels inside Australian Residences”;
- Australian Mobile Telephone Base Station Survey 2007: Addressing Public Concern Regarding Exposure to Radiofrequency Fields.”
- “Naturally Occurring Radioactive Material (NORM) residues: management, modelling and regulation”, which included a follow-up to the RHSAC position paper on NORM (2005) and the development of a safety guide on NORM.

ARPANSA officers also attended and presented at the following conferences:

- Electrical industry Energy 21C conference in Sydney on 14 November 2008 where ARPANSA's presentation focused on the state of knowledge concerning health effects of low frequency electromagnetic fields and the development of the ARPANSA standard on exposure on Extremely Low Frequency Electric and Magnetic fields.
- Annual Conference for Laboratory Technicians (LABCON) in Melbourne on 30 November 2007 where ARPANSA gave a presentation on "Mobile Telephony and Children".
- Annual Conference of the Australian Institute of Occupational Hygienists in Melbourne on 1 December 2007 where ARPANSA made a joint presentation entitled "Non Ionising Radiation EMR, RF, ELF".

PUBLICATIONS

RX Davey, YC Leong, J Javorniczky & RO Fullinfaw, Porphyria Cutanea Tarda at The Royal Melbourne Hospital: 1975 to 2005, *Clin Biochem Rev*, 2007, 28 (Suppl. 1):25

O'Riordan DL, Glanz K, Gies P and Elliott T. A Pilot Study of the Validity of Self-reported Ultraviolet Radiation Exposure and Sun Protection Practices Among Lifeguards, Parents and Children. *Photochemistry and Photobiology*. (accepted for publication)

Medical radiation

RADIATION IN HEALTH CARE – SAFER AND BETTER USE

The 2007 Budget measure Radiation in Health Care – Safer and Better Use has provided ARPANSA with funding to work with the medical professions to optimise the use of radiation in medicine so as to ensure that the best outcomes are achieved for patients. This will be achieved by:

- the purchase and operation by ARPANSA of a state-of-the-art medical linear accelerator (linac) with the capability to perform the accurate calibration of radiation doses delivered to cancer patients by clinically applicable megavoltage radiation beams, both for current and emerging radiotherapy technologies.
- ARPANSA working to improve the safe and effective use of ionizing radiation in medical diagnosis and therapy by actively engaging with the medical professions, providing training and access to research facilities for persons working in the medical radiation field and by providing radiation dose information, and information on techniques to reduce radiation doses to patients and occupationally exposed persons.

The request for tender to supply and install a clinical Linear Accelerator for a dosimetry standards and therapy calibration service closed on 23 November 2007 and

Medical Radiation Branch is in the process of seeking a licence under the ARPANS Act to operate the linac.

PERSONAL RADIATION MONITORING SERVICE (PRMS)

ARPANSA 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.

A software developer is to be engaged for 6 months to perform maintenance on the PRMS Application and to undertake enhancements to the software. The developer will also engage in knowledge transfer activities to enable ARPANSA officers to maintain the software into the future.

Work is in progress to determine revised filter specifications for the new monitor holder. When complete these specifications will be communicated to the supplier who will deliver a series of new prototypes for another round of testing. It is anticipated that these tests will identify an acceptable configuration, allowing the project to be concluded.

IONIZING RADIATION STANDARDS (IRS) – CALIBRATION SERVICES

In the therapy dosimetry audit program, a further 2 photon beams have been audited for a total of 10 beams from 4 treatment centres since July 2007. Two centres are scheduled for exposures in March 2008 and have been sent TLD kits. Two more centres will participate later and are being sent preliminary information.

The feasibility study undertaken by ANSTO to resolve the condition of the appropriate transfer flask for the Cobalt-60 source replacement and its transport re-certification requirements has been completed. Preliminary steps have been started to undertake certification, but due to other factors the earliest that this will be achieved is estimated to be late March 2008.

ARPANSA staff attended the following:

- the EPSM 2008 meeting in Fremantle, 14 - 18 October 2007, and during that time also attended a dosimetry comparison at the Sir Charles Gairdner Hospital for WA hospital physicists. The protection level calibration facility supplied by ARPANSA to WA Health was reviewed for maintenance purposes.
- the APMP TCRI meeting/workshop in Sydney from 29 - 30 October 2007 and presented results for the development of absorbed dose and exposure standards. The comparison programs and calibration and measurement capabilities (CMC) under the CIPM Mutual Recognition Arrangement were discussed.
- the CCRI Regional Metrology Organisation Working Group on CMC submissions at the BIPM, Paris, between 29 - 30 November 2008, providing rapporteur service and dosimetry expertise.

MEDICAL PHYSICS

The preparation of a national survey of radiation doses from Computed Tomography (CT) is continuing. A major aim of the survey is to measure the impact of new technologies and procedures on patient doses in CT.

RADIOPHARMACEUTICAL

A new Memorandum of Understanding (MoU) has been entered into by ARPANSA and the Therapeutic Goods Administration (TGA) in relation to the testing and evaluation of radiopharmaceutical medicines for human therapeutic use. The MoU is for the period 1 January 2008 to 30 June 2009.

Environmental Radiation

A field trip to Maralinga was conducted for further monitoring at the former British atomic weapons test sites. This trip was conducted under the Maralinga Land and Environment Management Plan measurements program.

ARPANSA's Radioanalysis Laboratory has commissioned new alpha spectrometry counting systems which are now in regular use. ARPANSA participated in an intercomparison as part of the ERA MRAD-7 proficiency testing program for alpha emitting radionuclides (Pu-238, Pu-239, U-234, U-238). All results were within limits. ARPANSA also participated in the IAEA ALMERA network proficiency testing program: gamma emitting radionuclides in soil, spinach and water (rapid turnaround time: 1 day). Results from this intercomparison have not yet been made available.

HEALTH PHYSICS

Monitoring and Surveillance Group

ARPANSA provided comment and advice regarding the potential health impacts of elevated levels of radionuclide contaminants found in a shipment of wild berries that entered Australia in November 2007. The levels did not exceed the International Guideline Levels for trade and import described in the Codex General Standard For Contaminants and Toxins In Foods, CODEX STAN 193-1995, Rev.3 (2007). ARPANSA's Health Physics Report (Ref: D0717101) recommended to Australian Quarantine and Inspection Service (AQIS) that the food contained in the shipment should be considered as safe, from a radiological perspective, for human consumption.

Professor Seung Yeon Cho, based in the Department of Environmental Engineering at the Yonsei University, Seoul, Republic of Korea, visited ARPANSA during December 2007. He is acting as a leading consultant for the Korean government (Ministry of Environment) to develop and undertake a major radon-222 survey of Korea from 2008 to 2012. ARPANSA will provide advice and guidance on the development of a Korean radon calibration service.

In December, ARPANSA provided comment on the possible health impact of inhalation or ingestion of strontium-90. A strontium-90 fact sheet was generated that included information about its physical properties, how it is used in industry,

environmental sources and levels, what happens to it once entered into the body and what are the primary health effects.

The ARPANSA's radon laboratory provided 2 radon-222 standard exposures for calibration of the ARPANSA radon dosimetry service maintained by the Personal Radiation Monitoring Service (PRMS).

SERVICES

Statistics on the outputs of ARPANSA's Radioanalytical Services are at Annex B.

Public communication activities

ARPANSA officers convened a meeting of the Electromagnetic Energy Reference Group (EMERG) on 21 November 2008 in Sydney to discuss ARPANSA activities and community concerns regarding EMR in the environment. This information is used to guide the preparation of public information on the issues and to help plan measurement programs.

The CEO of ARPANSA and officers gave presentations at a public symposium entitled "Answering your Questions about Communications Technology and Health" organised by the Australian Centre for Radiofrequency Bioeffects Research at Swinburne University on 31 October for Science Week.

During the reporting period there were 98,303 visitors to the ARPANSA website. The most popular web pages were radiation and health information sheets and educational pages dealing with the basics of radiation science.

Visitors downloaded 37,329 documents. The most popular document was a factsheet about extremely low frequency magnetic fields which can be found at http://www.arpansa.gov.au/pubs/factsheets/mag_fields.pdf.

National leadership in radiation protection and nuclear safety

Comprehensive Test Ban Treaty – air sampling monitoring systems

As part of Australia's commitment to the Comprehensive Nuclear-Test-Ban Treaty, ARPANSA continued to operate and maintain radionuclide air monitoring stations at Melbourne, Perth, Townsville, Darwin, and the Cocos Islands, Australia. The two remaining stations to be installed to be located at Macquarie Island and Mawson, Antarctica.

ARPANSA had previously responded to a Request for Proposal from Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) for the installation of a radionuclide air monitoring stations on Macquarie Island. However, due to CTBTO concerns over the cost of the project, submission of a final proposal was delayed for approximately 12 months. In December 2007, a revised proposal was submitted to the Commission, taking into account the financial concerns initially raised.

In November 2006, the SAUNA II Noble Gas analysing system was installed in Darwin by Gammadat Instruments AB, which forms part of the CTBT International Monitoring System. ARPANSA has submitted to CTBTO a Budget for the testing and evaluation of Phase III of the Noble Gas experiment, and a contract for this activity is still to be negotiated. In November 2007, a senior technician from the Analysis and Monitoring Section attended a CTBTO Noble Gas Technical Training Program in Stockholm, followed by several days of in-depth training at the Gammadat Instruments laboratory.

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 was formally certified by the CTBTO in December 2006. A contract for the provision of ongoing Radionuclide Laboratory services has been finalised.

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. ARPANSA is in the process of negotiating an MOU with ASNO with regard to the provision of limited NDC services that are both timely and effective.

National Uniformity

The Radiation Health Committee (RHC) discussed a paper proposing a different approach to the future development of the National Directory for Radiation Protection (NDRP). In particular, proposals would be developed and considered separately, and thereby enable straightforward issues to progress and not be held back by issues requiring more complex regulatory impact assessment.

This approach was agreed and the first proposal would be to adopt the Codes of Practice published since edition 1 of the NDRP, as these had already been through a regulatory impact assessment and consultation process. RHC members were asked to vote on inclusion of the Codes by the end of January 2008.

The Committee also agreed to a proposal that consultancies be provided to complete reviews of competencies and registration requirements.

Radioactive Source Security

ARPANSA completed refurbishment of secure office accommodation at its Miranda premises and progressed recruitment of specialist staff to aid the agency in delivering the implementation of recommendations in the Council of Australian Governments' report on security of sensitive radioactive sources.

ARPANSA worked with Pacific Northwest National Laboratory, Lawrence Livermore Laboratory and Sandia National Laboratory to finalise draft practical guidance for the security of panoramic irradiators, research irradiators, blood irradiators and high dose brachytherapy machines. The guidance will be subject to industry and government consultation and will promote uniform national implementation of the Code of Practice for the Security of Radioactive Sources which is a central recommendation in the COAG report.

Radiation Emergency Operations

ARPANSA officers attended the United States Top Officials exercise (TOPOFF 4) in October 2007. ARPANSA officers deployed with response teams from the United States Department of Energy and participated in the exercise scenario in Portland Oregon as observers. Lessons learned from the exercise will be incorporated in ARPANSA Emergency Preparedness and response plans and training.

In November 2007, ARPANSA conducted emergency response team member training. The training held over a week, trains ARPANSA officers to participate in emergency response teams in the event of a Radiological or Nuclear emergency or incident.

As part of the Global Initiative on Combating Nuclear Terrorism, members of ARPANSA attended a workshop jointly hosted by the Chinese Atomic Energy Agency and the United States Department of Energy on Emergency Response. The seminar provided attendees with theory and practical training on how to prevent and detect suspected illegal activities involving radioactive and nuclear materials. The seminar confirmed existing ARPANSA procedures and provided further material to be included in future training and planning.

Emergency Preparedness

ARPANSA 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 October, the ARPANSA participated in a visit to the Ports of Darwin, Perth and Albany by the Technical Working Group of the Visiting Ships Panel (Nuclear) as part of the validation process to allow visits by nuclear powered warships.

In November, the ARPANSA 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.

The software system, ARGOS (*Accident Reporting and Guidance Operational System*) is a Decision Support System for Chemical Biological Radiological and Nuclear (CBRN) Emergencies. ARPANSA is coordinating a national project to evaluate the suitability ARGOS for Australian CBRN emergency planning. In December ARPANSA installed the ARGOS software onto computers at the AFP CBRN Data Centre and the ACT Emergency Services in Canberra as part of the evaluation.

International Activities

The CEO attended a meeting of the IAEA Commission on Safety Standards and of the Committee on Nuclear Regulatory Activities of the OECD's Nuclear Energy Agency.

ARPANSA regulatory officers participated in a collaborative programme with the Vietnamese Ministry of Science and Technology (MOST), and the Vietnamese Agency for Radiation Safety and Nuclear Safety and Control (VARANSAC). This

involved a series of presentations on ARPANS legislation, interviews with ARPANSA inspectors, and actual inspections of ARPANSA licensees.

ARPANSA officers attended the following international events:

- a Joint (EU-USA, Korea - Japan - China - WHO - Australia) Workshop on Mobile Telephony and Health in Brussels on 26 - 27 November 2007 and gave presentations on research on mobile phone electromagnetic radiation health effects in Australia and on Australian policies and public information concerning mobile phones and health. ARPANSA also visited the Radiation Protection Division of the Health Protection Agency in the UK for technical discussions concerning electromagnetic fields and health, and the National Physical Laboratory for discussions concerning calibration of instruments for measuring radiofrequency electromagnetic radiation.
- the final Plenary and Naturally Occurring Radioactive Material (NORM) working group meetings of the Environmental Modelling for Radiation Safety (EMRAS) Project at the IAEA in Vienna, 5 - 9 November 2007. The major topics discussed were procedures for reporting the results of the project, and preliminary planning for a follow-up project.
- the "Technical Meeting on the Outcome of the Application of Safety Assessment Methodologies for Near-Surface Radioactive Waste Disposal Facilities (ASAM) Project and Follow-up Activities" at the International Atomic Energy Agency (IAEA) in Vienna, 10 - 14 December 2007. This meeting enabled participants to report the findings of the ASAM project and decide upon activities for a forthcoming project that further promotes the use of the safety assessment methodology. The meeting's deliberations resulted in a draft project proposal for submission to the IAEA.
- the Nuclear Energy Agency Workshop (NEA) on Fuel Cycle Safety – Past, Present and Future held in Wilmington, NC, USA, 16 – 18 October 2007 and presented a paper entitled ‘Regulatory Management of Research Reactor Spent Fuel Facilities in Australia- Managing a Cropping Incident’ at that workshop.
- the 15th Meeting of IAEA Transport Safety Standard Committee (TRANSSC) in Vienna, 1-5 October 2007. The meeting focussed on harmonising the transport regulations with the Un model regulations; denial of shipment for radioactive materials and the transport of naturally occurring radioactive materials.
- the 24th Meeting of the IAEA Waste Safety Standards Committee (WASSC) at the IAEA in Vienna, 15 - 19 October 2007. Progress reports were presented on the documents under development including DS390 Safety Guide: Classification of Radioactive Waste. Australia had considerable input into the current draft of this document. The RHC has also agreed that Australia will develop its own waste classification scheme appropriate to the types of waste and the disposal options that we have available. Such a scheme will be consistent with DS390.

Regulation

Regulation of the Commonwealth's uses of radioactive material, apparatus and facilities

The CEO of ARPANSA is responsible for regulating all radiation and nuclear activities undertaken by Australian Government entities and contractors who undertake such activities for or on behalf of Australian Government entities (Commonwealth contractors).

ARPANSA officers assist the CEO to implement the regulatory scheme set out in the ARPANS legislation in particular by providing assessments and advice in connection with applications for source and facility licences under the ARPANS Act, including whether or not a licence should be issued, authorising dealings with radiation sources and conduct undertaken in relation to facilities, both prescribed radiation facilities and nuclear installations.

Monitoring compliance with the ARPANS legislative scheme for regulation, including by undertaking inspections and providing advice to the CEO on findings of breach of the Act and any subsequent recommendation as to enforcement action, is a major output of ARPANSA. Compliance monitoring includes the review of compliance reports submitted by licence holders.

Inspections for compliance monitoring

ARPANSA continues an active program of inspections to determine compliance with licences issued under the *ARPANS Act 1998*.

Inspections of nuclear safety focussed on:

- OPAL (Open Pool Australia Light-water) research reactor - licence F0157
- HIFAR (Hi-flux Australian reactor) - licence FO0044-4A
- Radiopharmaceutical and industrial radiopharmaceutical manufacturing facility – licence F0044-5A, 5B, 5C
- ANSTO – Waste operations and technology development – licence FO0044-4B
- ANSTO Fuel operations – licence FO0044-4C

Inspections of radiation safety focussed on:

- ANSTO Radiotracer Facility – Lucas Heights, Sydney - F0044-7B
- Australian Customs Container Examination Facility – Matraville, Sydney - F0125
- Department of Defence – Edinburgh Storage Facility – F0117
- Department of Defence – Woomera Storage Facility – F0084
- Australian Customs Service – Sydney Gateway Facility – S0092
- CSIRO Industrial Physics – Canberra Deep Space Communication Complex - S0105

Transport of radioactive materials

ARPANSA approved the following packages and shipment of radioactive material.

Title	Date Submitted	Status
Validation of a type B(U) package for transport of fresh fuel of OPAL	20/9/07	Approved 19/12/07
Shipment of fresh fuel for OPAL Reactor	19/12/07	Approved 20/12/07
Design approval for a type B(U) package for transport of radioactive material	In final form 4/10/07	Approved 14/12/07

OPAL Research Reactor Modification to Fuel Assembly Design following shutdown

In July 2007, ANSTO discovered that several fuel plates had become displaced from their original positions in fuel assemblies that had been located in the core of the OPAL reactor. The reactor was shutdown to allow the incident to be investigated and has not recommenced operation. Following this investigation, ANSTO determined that a modification to the design of the fuel used in the reactor was necessary.

On 21 December 2007, the CEO of ARPANSA, received a submission from ANSTO seeking approval for a new design of fuel for the OPAL reactor and to operate the OPAL reactor using fuel manufactured in accordance with this design.

The ARPANS Act imposes a requirement on ANSTO to seek the CEO of ARPANSA's approval prior to making a relevant change to the OPAL reactor or its fuel that will have significant implications for nuclear safety.

In addition to detailed information about the design of the proposed replacement fuel, which is intended to prevent any future dislodgement, ANSTO's submission includes a root cause analysis, which examines the cause of the dislodgement of the fuel plates. The submission also outlines proposals for taking the OPAL reactor back to power.

ARPANSA plans to utilise external expertise to assist its staff in evaluating the submission, particularly in the areas of vibration and of reactor fuel design and manufacture.

REGULATORY PERFORMANCE

KEY PERFORMANCE INDICATORS (KPI)

These KPI's have been established and are monitored as part of the regulatory planning and performance monitoring process. They are provided here to indicate the extent of the process and the performance monitored this quarter.

PROGRESS AGAINST KPI'S – 1 October 2007 to 31 December 2007

Measure	Activity	Annual Target
<i>Effectiveness</i>		
1. Accidents that must be reported within 24hours	0	< 5
2. Incidents	4	< 40
3. Percentage incidents reported by licence holders	100%	> 80%
4. Breaches	3	< 40
5. Percentage breaches reported by licence holders	0%	> 80%
6. Applications for Licence	3	-
7. Percentage licence applications accepted as valid	100%	> 80%
8. Percentage assessment reports for applications for licence	100%	100%
9. Percentage correct decisions for licence applications	100%	100%
10. Requests for Approval (Regs 51,53,54,55)	5	-
11. Assessment Reports	9	-
12. Percentage positive decisions for requests for approval	100%	>80%
13. Inspection Reports	9	> 80
14. Licence Holder Compliance Reports	87	-
15. Percentage licence Holder Compliance Reports received on or before due date	53%	> 80%
<i>Efficiency</i>		
16. Percentage of ministerial responses meet target date set in agreement with Department	100%	> 80%
17. Number of inspection and assessment reports per staff member	1.3	> 10
18. Expenditure/budget	< 100%	< 100%
19. Revenue/budget	Note a	100%

Measure	Activity	Annual Target
20. Percentage staff training completed (%)	>80%	> 80%
21. Time to provide requested information to stakeholders	Note a	< 30 days
22. Average time to report inspections	81 days	< 30 days
23. Time to review Licence Holder Reports	Note a	< 30 days
24. Time to review Applications for Licence	133 days	< 60 days
25. Time to review requests for approval (Regs 53, 54, 55)	1 day	< 30 days
26. Time to review requests for approval (Reg 51)	26 days	< 60 days
27. Time to complete investigation of incidents/accidents	Note a	< 60 days
28. Time to complete investigation of breaches	Note a	< 60 days
<i>Stakeholder Satisfaction</i>		
29. Satisfaction Surveys	Note c	> 80% satisfied with services provided
30. Complaints	0	< 20
31. Compliments/commendations	1	> 5
32. Reports to ARPANSA Executive as planned	1	100%
<i>Enforcement</i>		
33. Educational and awareness information sessions and short presentations for licence holders	0	> 3
34. Corrective measures	0	> 40
35. Formal Directions	0	> 0
36. Percentage suspensions and cancellation of licences	0	> 0%

Notes

- a. Regulatory Processes being further developed to capture these measures.
- b. There are applications in progress but none were finalised during the December 2007 quarter.
- c. No surveys were carried out during the December 2007 quarter. A survey is planned for June 2008.

The annual targets were derived based by estimation only. They will be progressively refined over time as actual data is collected and trends can be determined.

IAEA Integrated Regulatory Review Service Mission to Australia

For the quarter ending 30 June 2007, ARPANSA reported that the results of the Australian Mission held during 2007 would be discussed at the senior regulators' meeting at the IAEA General Conference in September 2007.

The outcomes of the IRRS Mission to Australia, along with those to France, the UK and Japan, were discussed. Each of the missions had been tailored to suit the circumstances and requirements of the country under review. Consistent with the Australian experience, it was agreed that the missions were an effective review process. Their value lies particularly through the self-assessment process and action plan prepared by the regulatory body and in the interaction between the review team experts and the country counterparts. Australia was commended as being the first non nuclear power country to accept an IRRS Mission.

Details of Regulatory Activities

Further details of regulatory activities 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

Radiation Health and Safety Advisory Council

The Council met on 7 December 2007 at ARPANSA's Miranda office. A summary of Council's meeting is available on the ARPANSA web site at <http://www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm>.

The main issues discussed at the meeting were:

- Council discussed a draft letter replying to the CEO's request at the August 2007 meeting for Council to consider a matter of interest to the general public regarding the safety of nuclear power plants. The Chair advised that the Chair of Nuclear Safety Committee (NSC) had been involved in the consultation process, the Chair had also discussed an early draft at the NSC meeting on 26 October 2007, and NSC members subsequently provided comment. Council had also engaged with Dr Sam Harbison, Ex-Chief Inspector of Nuclear Installations in the UK, and a current member of International Nuclear Safety Group (INSAG), including his participation in teleconferences. The final letter was forwarded to the CEO on 14 December 2007.
- Council was advised of the development of the Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation. Council was advised that the Radiation Health Committee (RHC) had agreed that the Code was substantially complete and would approve it when the final Regulatory Impact Statement (RIS) was available. Council agreed that the Code was substantially complete and could be considered out of session after finalisation of the RIS and RHC approval of the Code.
- Council received a report that the IAEA had revised the publication currently adopted in the Australian Code of Practice for the Safe Transport of Radioactive Material. It was therefore proposed to adopt the IAEA 2005 publication in a revised Australian Code. Council agreed to recommend to the CEO that the Code be published.
- The Chair noted that the CEO had agreed to hire a consultant to assist Council in conducting a review of the efficiency and effectiveness of the National Directory for Radiation Protection. The project work would commence mid-December with a report ready for the April 2008 Council meeting. Council noted the progress with the review.
- An officer from the Australian Federal Police Chemical Biological Radiological and Nuclear Data Centre (CBRNDC) made a presentation on the roles and functions of the Centre.

Radiation Health Committee

The Committee met on 21 and 22 November 2007 at ARPANSA's Yallambie offices. A summary of the meeting is available at <http://www.arpansa.gov.au/AboutUs/Committees/rhcmnt.cfm>.

At the meeting the following matters were considered:

- The paper prepared by the Queensland Institute of Medical Research (QIMR) for ARPANSA on the health effects of using solaria and cost effectiveness of enforcing regulations in Australia. The Committee agreed that the options paper was a sound document that could be used in assessing the impact of any possible future regulation of solaria. The Committee also considered a draft paper summarising the outcomes of the National Forum on the Impacts of Regulating Solaria and formed a working group to develop the outcomes of the Forum into a regulatory format. The Forum outcomes will form the basis of a paper to the Australian Health Ministers' Conference (AHMC) about uniform regulation of solaria.
- A revised version of the draft Medical Code had been prepared taking into account comments made in the public comment period. The Committee was informed that the *National Conference on Radiation Protection in Medicine*, had provided a major opportunity for consultation with stakeholders. The Committee agreed to accept the invitation from the Royal Australian and New Zealand College of Radiologists (RANZCR) to discuss their comments, particularly the issues related to diagnostic reference levels (DRLs) and the implementation of the Code. The Committee, while accepting that the Code was now substantially complete, agreed that it could only formally endorse it after completion of the Regulatory Impact Statement (RIS), and agreed that this would take place out of session. It recommended that the draft Code be forwarded to the Council for consideration, requesting that Council also consider the final Code and RIS out-of-session.
- A revised version of the draft Transport Code that had been amended following a period of public comment. The Committee was advised that a Regulatory Impact Statement was not required and that a Safety Guide to accompany the Code was being finalised separately. The Committee approved the draft Code for publication and recommended that the CEO forward the draft to the Council for its recommendation on adoption. The Committee discussed the possibility of combining the Transport and the Dangerous Goods Codes and suggested that the Department of Transport and Regional Services (DOTARS) be consulted on the proposal, possibly via a proposed executive meeting of the Transport Competent Authorities Working Group.
- A review of the suitability of the April 2007 version of the draft Veterinary Code. A revised Code and a Safety Guide had subsequently been prepared. The Committee proposed that a small working group be established to develop the Code and Safety Guide.
- A document development plan (DDP) proposing that a safety guide on the methods for monitoring, assessing and recording occupational radiation doses received in mining and mineral processing be developed as an ARPANSA

Radiation Protection Series publication. The Committee decided that the Safety Guide should cover uranium mining and mineral sands operations.

- A first draft of a Safety Guide for the Management of NORM in Australia. The Committee agreed that the content of the draft was appropriate. The working group will prepare a draft ready for Committee approval for public comment for the March 2008 meeting.
- A paper describing the factors to be considered when purchasing a radioactive source. The Committee decided that a RHC Statement be developed for the ARPANSA web site to assist regulators and users when selecting a radioactive source.
- A draft RHC Statement on the safe use of short wave diathermy and electrosurgical equipment. The Committee decided to discuss the draft with the Australian Physiotherapists Association (APA) and ascertain how many diathermy units actually exist.
- A paper proposing that a working group be established to assess whether the science underpinning ARPANSA *RPS No. 3 Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002)* is still current and whether the derivation of the exposure levels in the Standard is therefore still valid. The Committee was informed that the final report of the 13 country Interphone Study was expected in early 2008. The Committee decided that, providing that the report of the Interphone Study was available, a report should be prepared for the March 2008 RHC meeting recommending whether a formal review of *RPS 3* be undertaken.

Other matters considered by the Committee at the meeting were:

- That the International Commission on Radiological Protection (ICRP) has finalised its 2007 Recommendations, which raise the significance of optimisation as a key element in radiation protection. The Committee agreed that a review and re-write of ARPANSA *RPS No. 1 Recommendations for Limiting Exposure to Ionizing Radiation (1995) and National Standard for Limiting Occupational Exposure to Ionizing Radiation (republished 2002)*, which was based on ICRP 60 (1990), was needed to bring it in line with the new ICRP Recommendations and its application of the optimisation principle. The Committee requested that a Document Development Plan (DDP) be prepared for the next RHC meeting. The Committee noted that the *IAEA Basic Safety Standards (BSS)* review had commenced and a revised *RPSI* would need to take the BSS revision into account.
- The report of the outcomes of the IAEA Integrated Regulatory Review Service (IRRS) Mission. The Committee agreed with the recommendations in the report, which included implementing the recommendations of the COAG Report on Hazardous Materials, bringing forward papers on security of sources from time to time, completing the RHC's earlier work on the classification of radioactive waste; and holding an executive level meeting of Transport Competent Authorities to discuss the IRRS report suggestions and transport issues.

- A common document for Codes, containing common licence conditions and conditions of registration, would be prepared for the March 2008 meeting.
- A briefing on the work of Government Skills Australia (GSA), who provide training resources and services to support the recognition of skills and professionalism in government administration, services and operations. The Committee endorsed the concept of developing competency standards and decided that the project should be progressed at the Radiation Regulators Forum and reported back to the RHC when ready.

Nuclear Safety Committee

The NSC met on 26 October 2007 at ARPANSA's Miranda office. A summary of the meeting is available at <http://www.arpansa.gov.au/AboutUs/Committees/nscmt.cfm>.

At the meeting the Committee considered the following matters:

- The hot commissioning of the OPAL Reactor including issues that needed to be resolved before full operation of OPAL could be approved including the reflector vessel repairs and the fuel plate event.
- ANSTO updated the Committee on the fuel plate event and what progress ANSTO had made in investigation and rectifying the situation.
- Members were updated on progress with the upcoming IAEA Research Reactor Conference that ARPANSA staff members had been involved in organising. The Regulatory Branch presented a paper titled *Regulatory Review Methods: Review of the ANSTO Application for a Facility Licence to Operate the OPAL Research Reactor in Australia: Case Study Review of Operational Readiness* scheduled to be delivered at the Conference to the Committee for information.
- ANSTO planning for decommissioning. The Committee was updated on progress with the decommissioning of HIFAR and noted the reply from Dr Loy to Dr Ian Smith, CEO of ANSTO. Although ANSTO had not formally responded to the letter, a meeting had been held between ARPANSA and ANSTO that outlined the main issues.

The Committee also visited the Bragg Institute and the OPAL Reactor at ANSTO on the afternoon before the meeting (Thursday 25 October 2007) during which ANSTO staff provided briefings on the fuel plate event and proposed repairs, and the role of the Bragg Institute.

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 ARPANS 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

The CEO determined the following breaches of licence conditions during the quarter:

- CSIRO Food Science Australia S0023 – breach of Regulation 53 – unauthorised disposal of UV equipment
- Australian National University – S0027 – breach of Section 31 of Act and Regulation 51 – possession of unlicensed controlled apparatus (RF and UV equipment)
- ANSTO – breach of Regulation 49 - failure to comply with its internal processes in regard to the formal accreditation of an OPAL Shift Manager in February 2007. The CEO of ARPANSA relied on plans and arrangements when he concluded that the training and accreditation process for shift managers was sufficient to grant ANSTO a licence to operate the reactor on 14 July 2006. Since identification of the breach through an ARPANSA Inspection, ANSTO have taken corrective steps. The shift manager concerned has now been properly accredited and subsequent accreditations have been undertaken in accordance with the appropriate plans and arrangements.

In each case, the CEO considered whether or not to take enforcement action. However, as each licence holder took corrective action upon notification of the breach by ARPANSA, the CEO determined that enforcement action was not necessary.

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

RHSAC report to the CEO on assessment of the safety of nuclear power plants was received during the quarter.

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

A facility licence (F0187) was issued to Australian Customs Service for decommissioning of the Brisbane neutron scanner. A list of all licence applications

received during the quarter as well as any licences issued, amended or surrendered during the quarter is included in Annex A.

Annex A – Regulatory Operations

Nuclear Installations

OPAL Research Reactor – Operating Licence F0157

SAFETY SUBMISSIONS UNDER ARPANS REGULATION 51

Safety Submission	Title	Date Submitted	Status
E0072	Seal Box Modification to Facilitate Alignment	23/10/07	Approved 27/11/07
E0083	FA Modification To Incorporate A Stopper	21/12/07	Under Assessment

INSPECTIONS

Four inspections were undertaken during the quarter. These are listed below:

Date of Inspection	Type	Scope of Inspection
23/10/07 (*)	Unannounced	Main Control Room Log Books
25/10/07 (*)	Unannounced	Main Control Room Log Books
13/12/07	Unannounced	Main Control Room Log Books
20/12/07	Unannounced	Housekeeping

(*): these were incorrectly reported during previous reporting period

HIFAR Facility - Operating Licence FO0044-4A

APPLICATION FOR A POSSESS OR CONTROL LICENCE

On 20 September 2007 the CEO of ARPANSA wrote to ANSTO seeking clarification and additional information on the application. On 26 October 2007 ANSTO provided some clarification and information and outlined additional information ANSTO proposes to provide. The CEO is awaiting that information.

INSPECTIONS

An inspection of HIFAR took place on 28 November 2007. Its purpose was primarily to ensure that ANSTO was not undertaking activities which did not fall within the confines of the operating licence and compliance monitoring of activities. Safes containing radioactive sources were to be subject to a follow up inspection in the next quarter.

Nuclear Safety - Non-Reactors

ANSTO - Waste Operations and Technology Development (Facility Licence FO0044-4B)

INCIDENTS/ABNORMAL OCCURRENCES

An incident involving release of particulate radioactive waste inside a hot cell that occurred during solidification of molybdenum waste was reported in the previous quarter. The release of radioactive material was contained within the hot cell. There was no operator exposure from this incident. The cell clean up and the investigation of root cause is in progress. ARPANSA inspected the facility to follow up the action taken after the incident and determined that there was no radiological safety implication from this incident. The incident is being rated by ARPANSA as International Nuclear Event Scale (INES) level 0.

ANSTO - Fuel Operations (Facility Licence FO0044-4C)

RELEVANT CHANGE

ARPANSA considered an application for a relevant change with significant implications for safety under regulation 51 of the ARPANS Regulations, being an upgrade to the ventilation system for a fuel management facility. Having determined that this upgrade would improve safety in operation of the facility, ARPANSA approved the application.

Licence applications received during the quarter:

Type of application	From
Source Licence Application - S0027	Australian National University
Source Licence Application – S0033	Note Printing Australia
Source Licence Application – A0190	ASC Pty Ltd (formerly Australian Submarine Corporation)

Licence issued or amended during the quarter:

Type of licence and authorisation	To
Source – amendment of licence S0008	Department of Environment and Water Resources – Australian Antarctic Division – Polar Medicine
Source – amendment of licence S0077	National Museum of Australia
Source licence issued – S0188	Attorney General’s Department D Branch – Baggage X-ray sets
Facility Licence issued – F0187	Australian Customs Service – Decommissioning of the Brisbane Neutron Scanner

Annex B – Service Operations

B.1 The Radiofrequency Calibration Laboratory

Calibration Requests	Jobs completed as NATA accredited reports	Job composition
67	52	36 monitors (with 39 probes) 27 personal monitors

B.2 Ultraviolet Protection Factor Testing, Licensing and Labelling

Job requests	Fabric samples tested	UPF trademark licenses completed	UPF swing tags issued	Pairs of sunglasses tested
98	416	17	886,000	two

B.3 Radioanalytical Service

Water	Food	Soil/Sediment	Filter	Wipe test
220	34	1	86	67

Maypacks	Biota	Other
0	0	14

B.4 Dosimetry Calibration Services

Therapy reference dosemeters	Electrometers	Gamma survey meters	Neutron survey meters	Personal dosimeters	Reference beams from sources or generators	Jobs in progress
1	1	3	-	-	-	3

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
135	120	6	9

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
111	37	2	72

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

Total Permits Issued	-
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