



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

**QUARTERLY REPORT
OF THE
CHIEF EXECUTIVE OFFICER
OF ARPANSA
FOR THE PERIOD 1 JANUARY 2010 TO 31 MARCH 2010**



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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 web site at www.arpansa.gov.au.

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Letter of Transmittal

18 May 2010

The Hon Mark Butler MP
Parliamentary Secretary to the Minister
for Health
Parliament House
Canberra ACT 2600

Dear Parliamentary Secretary

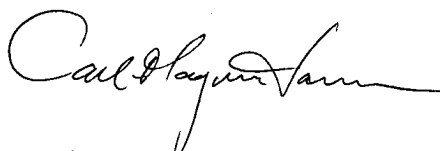
The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- 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
- 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 January 2010 to 31 March 2010.

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



Carl-Magnus Larsson
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 key strategic directions:

- apply best practice regulation through the promotion of national uniformity and regulation
- promote the most effective use of radiation in therapeutic treatments and in diagnostic medicine
- improve radiation protection of workers, the public and the environment from natural sources including uranium mining and radioactive waste disposal
- assure the security of radioactive sources in Australia and strengthen Australia's capability to respond to radiation emergencies
- monitor and advise on population exposures to ultraviolet radiation, extremely low frequency electric and magnetic fields and electromagnetic radiation.

National uniformity and regulation

National Directory and national uniformity

The main vehicle for the promotion of national uniformity of radiation protection throughout the jurisdictions is the National Directory for Radiation Protection (NDRP) which is jointly developed by ARPANSA with the State and Territory jurisdictions through the Radiation Health Committee (RHC).

During the quarter, Amendment 5 of the NDRP, dealing with a clarification on the application of ionizing radiation principles to non-ionizing radiation, adoption of the Veterinary and Chiropractic Codes, and a range of editorial matters was agreed by the RHC and will now be forwarded to Australian Health Ministers Advisory Council and Ministers for endorsement.

Amendment 4 on solaria was forwarded to Ministers for endorsement in October 2009, and still awaits the response of one jurisdiction.

Further amendments on user disposal of low level radioactive waste and the use of older sources were discussed and will be developed further. A regulatory impact statement related to a proposed amendment on the cosmetic use of lasers and intense pulsed light sources (IPL) is being developed.

The RHC approved the transmission of the *Recommendations for the Classification of Radioactive Waste* to the Radiation Health and Safety Advisory Council for its consideration.

Commonwealth regulation

SIGNIFICANT LICENSING ACTIVITIES

Following closure of the Defence radioactive waste management facilities at RAAF Edinburgh and Woomera in South Australia, ARPANSA undertook a series of environmental radiological surveys of the buildings and their surrounds and was able to confirm the absence of radioactive contamination. The absence of contamination was confirmed. This program was well managed by Defence. The outcome of this assessment will enable ARPANSA to consider whether or not the site is ready to be released from regulatory control. The outcome of this consideration will be reported in the next Quarterly Report.

In January ARPANSA approved under Regulation 51 the final decommissioning and site restoration of the Australian Nuclear Science Technology Organisation (ANSTO) Moata Reactor at Lucas Heights in Sydney. Decommissioning activities commenced in February 2010. Decommissioning is expected to be completed in the next quarter. ARPANSA inspectors have maintained oversight of the project as it is the first decommissioning of a reactor to be undertaken in Australia and under the ARPANS Act. The process will be of interest to the international community and ARPANSA will continue to participate in international fora where the regulatory processes for decommissioning are discussed. ARPANSA received a request from ANSTO to use an alternative manufacturer of Low Enriched Uranium (LEU) plate type targets which are irradiated in the OPAL reactor and then processed to produce radioisotopes which are subsequently used in radiopharmaceuticals. The submission was approved in March 2010 under Regulation 51 which requires the CEO to give his prior approval to a relevant change with significant implications for safety.

ARPANSA authorised the routine operation of the Petnet cyclotron facility of Pet Net Australia Pty Limited, a wholly owned subsidiary of ANSTO, for the production of Fluorine 18 for Fludeoxyglucose (FDG) synthesis. FDG is used in Positron Emission Tomography (PET) imaging.

ARPANSA approved ANSTO's submission for the construction of External Liquid Waste Interim Storage on 11 February 2010 under Regulation 51 of the ARPANS Regulations 1999. This storage is principally required for liquid waste arising from the production of Molybdenum within the ANSTO site.

As the Competent Authority for inland transport by Commonwealth entities, ARPANSA issued in accordance with the ARPANSA Code of Practice for the Safe Transport of Radioactive Material the following:

- Validation certificate, AUS/2010-31/B(U)-96
- Shipment certificate, AUS/2010-32/B(U)F-96T.

SAFETY AND COMPLIANCE OUTCOMES

It is a fundamental principle that the responsibility for safety lies with the operator. It is the role of an independent nuclear safety and radiation protection regulator to be assured that the operator is managing safety appropriately, including the maintenance

of an effective safety culture. The regulator must take action that it considers appropriate and proportionate to ensure this outcome.

It is ARPANSA's role to be assured that the use of radioactive material and associated facilities is being undertaken in a manner that protects the safety of workers, the public and the environment.

During the period ARPANSA continued to stress the importance of the licence condition that requires each licence holder to submit a quarterly report on their activities to ARPANSA for review. The quarterly report prepared by each licence holder is an important internal compliance assurance process. In relation to smaller licence holders for whom radiation safety is not core business it is an important trigger for them to consider radiation safety aspects of their operations and report the outcome of their own assessment of their compliance with licence conditions to the regulator. There has been substantial improvement of on-time reporting of quarterly reports as a consequence of this compliance initiative by ARPANSA. ARPANSA undertakes a program of planned announced and unannounced inspections. ARPANSA continued its inspection programme during the quarter of licensees dealing with radiation in industrial, research and medical establishments.

REGULATORY GUIDANCE

The regulatory guide: *How to determine if a Class 1M or Class 2M laser product is a controlled apparatus* was issued in February 2010 and is now available on the ARPANSA web site.

INVESTIGATION OF INCIDENTS AT AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION (ANSTO) AUSTRALIAN RADIOPHARMACEUTICAL INDUSTRIES (ARI)

ARPANSA has been undertaking a series of investigations involving three incidents dating back to 2007 and which were reported to ARPANSA by a member of ARI staff.

The incidents involved the isotopes, I-123, Mo-99 and Y-90. An inspection report in relation to the initial investigation into these incidents was finalised in June 2009. A further inspection report on the Mo-99 incident was finalised on 31 March 2010. It received media attention and it was also released under FOI. A report on the Y-90 incident is being finalised and a final set of conclusions in relation to these incidents will be made shortly and any appropriate follow up regulatory action undertaken, including consideration of whether or not ANSTO is in compliance with its licence conditions. Any decision taken in relation to compliance with licence conditions can only be taken after ANSTO has had an opportunity to make submissions in relation to a final decision, as required by the rules of procedural fairness.

If ARPANSA were to conclude that ANSTO is in breach of its licence conditions then ARPANSA must consider whether it will take further action, including enforcement action. ARPANSA takes a graded approach to enforcement and the CEO of ARPANSA has a range of enforcement powers under the *ARPANS Act*.

International engagement

COMMISSION ON SAFETY STANDARDS (CSS)

ARPANSA attended the 27th Meeting of the CSS that was held at the International Atomic Energy Agency (IAEA) in Vienna, from 17 to 19 March 2010, to approve safety standards documents under preparation and to provide advice for the Board of Governors on matters related to the standards. Highlights of the meeting included discussions about the Safety Requirements on Disposal of Radioactive Waste (DS354); the Safety/Security Interface, the discussions around International Commission on Radiological Protection activities related to radon and medical exposures.

OECD-NEA RADIOACTIVE WASTE MANAGEMENT COMMITTEE (RWMC) AND REGULATORS FORUM

ARPANSA attended a meeting of the RWMC and Regulators' Forum held at OECD-NEA Headquarters, Paris, from 23 to 25 March 2010. The meeting was also attended by a representative from the Australian Government Department of Resources, Energy and Tourism which is responsible for radioactive waste management policy in Australia.

A short presentation was made by ARPANSA providing a status update for Australia, including the National Radioactive Waste Management Bill 2010.

VISIT TO THE SWEDISH RADIATION SAFETY AUTHORITY

An ARPANSA officer spent three weeks at the Swedish Radiation Safety Authority in Stockholm from 11 to 29 January 2010. The Swedish Radiation Safety Authority is the Swedish national regulatory agency responsible for radiation protection nuclear safety and safeguards. The officer participated in the daily activities and took part in inspections and site visits during this time. A presentation was made about ARPANSA and its regulatory functions.

SOUTH EAST ASIA REGIONAL REVIEW MEETING ON RADIOACTIVE SOURCE SECURITY

The Vietnam Agency for Radiation and Nuclear Safety hosted the meeting of representatives of Bangladesh, Cambodia, Indonesia, Laos, Malaysia, Nepal, Philippines, Singapore, Thailand and Vietnam to discuss the implementation of the South East Asia Radiological Security Partnership with the Partnership's sponsors. The meeting was held at Da Lat, Vietnam, from 9 to 11 March 2010, and was sponsored by ANSTO, US DOE GTRI Program and the IAEA. Although ARPANSA was an observer at this meeting, it has requested full membership for future meetings.

IAEA TECHNICAL MEETING ON NUCLEAR SECURITY: RECOMMENDATIONS ON RADIOACTIVE MATERIAL AND ASSOCIATED FACILITIES

Between 22 and 26 February 2010, the IAEA hosted an open-ended technical meeting of all IAEA member states (technical meeting) to consider the latest draft of the recommendations document for Security Recommendations on Radioactive Material and Associated Facilities. Fifty one delegates from thirty seven member states and

two observers from the World Institute of Nuclear Security (WINS) attended. Australia was represented by ARPANSA

CTBT WORKING GROUP B-34

ARPANSA participated in the February session of the CTBT Working Group B-34 in Vienna, Austria, where verifications issues relating to the Treaty were discussed. In particular the status of the commissioning of the International Monitoring System was reviewed, and the draft work program and budget proposed for 2011 was considered.

6TH INTERNATIONAL SYMPOSIUM ON NATURALLY OCCURRING RADIOACTIVE MATERIALS (NORM)

ARPANSA attended the 6th International Symposium on NORM held in Marrakech, Morocco, from 22 to 26 March 2010. Highlights of the symposium included discussions about the new Basic Safety Standards (DS379), the use of phosphor-gypsum residues, reports of current issues regarding NORM in several countries including Australia, France, Belgium, China, Russia and Sweden. Delegates discussed the new ICRP Taskgroup being established to amplify ICRP103 Recommendations in the area of NORM.

IAEA ENVIRONMENTAL MODELLING FOR RADIATION SAFETY (EMRAS)

ARPANSA participated in the IAEA EMRAS second technical meeting, and the Biota, Legacy Sites and NORM Working Group meetings held at the IAEA Headquarters in Vienna from 25 to 29 January 2010. The Biota Working Groups discussed the outcome of model intercomparison exercises and reviewed the draft text of a new handbook to do with parameter values for the prediction of radionuclide transfer to wildlife. The Legacy Sites and NORM Working Group discussed the development of a general assessment methodology for dealing with contaminated sites that involved model development, evaluation and testing, and dealing with stakeholders.

ELEKTA TRAINING COURSE FOR LINEAR ACCELERATOR MAINTENANCE

An ARPANSA officer attended the Elekta oncology engineers first line transition training course for linear accelerator maintenance at the Elekta factory in Crawley, England, during three weeks in March. This training will provide ARPANSA with in-house expertise for basic maintenance of the standards medical linac.

TECHNICAL RESEARCH WORKSHOP AND TRANS TASMAN ONCOLOGY GROUP (TROG)

ARPANSA attended the Technical Research Workshop and TROG Annual Scientific Meeting that were held in Queenstown, New Zealand, from 24 to 27 March 2010. Highlights included: presentations on imaging and motion management in radiotherapy e.g. targeting moving tumors and image guidance; reports from the PROFIT (prostate) and CHISEL (hypo-fractionated lung) clinical trials; and discussions about the role of clinical trials in the introduction of new technology, and how to credential radiotherapy image guidance techniques for clinical trials, with talk of engaging diagnostic physicists for this purpose.

WORKSHOP ON THERMAL ASPECTS OF RADIO FREQUENCY EXPOSURE

ARPANSA attended a workshop on Thermal Aspects of Radio Frequency Exposure in Gaithersburg, Maryland, USA from 11 to 12 January 2010. The workshop, jointly sponsored by the US Food and Drug Administration, the Mobile Manufacturers Forum and the GSM Association, aimed to identify the critical health effects of temperature rises in the human body, which, at present, form the basis of exposure standards.

INTERNATIONAL COMMITTEE FOR ELECTROMAGNETIC SAFETY (ICES)

ARPANSA attended, as an observer, meetings of the ICES and its technical subcommittees, in Silver Spring, Maryland, USA from 13 to 15 January 2010. The ICES TC95 committee operates under the auspices of the Institute of Electrical and Electronics Engineers and prepares standards and guidelines for human safety in regard to exposure to electric and magnetic fields and electromagnetic radiation.

NEW ZEALAND MINISTRY OF HEALTH INTERAGENCY COMMITTEE ON THE HEALTH EFFECTS OF NON-IONISING FIELDS

ARPANSA attended, as an observer, the New Zealand Ministry of Health Interagency Committee on the Health Effects of Non-Ionising Fields in Wellington, NZ, on 17 March 2010. A report of recent activities in the area of non-ionising radiation protection in Australia and at ARPANSA was presented. The meeting discussed many issues of common interest to Australia and New Zealand, including current research into possible health effects of electromagnetic radiation and development in national and international guidelines and standards.

Radiation in medicine

Radiotherapy calibration service

The calibration service on the therapy level ARPANSA cobalt-60 gamma-ray source facility was suspended in early December 2009. In January, the old source that had decayed to below 14 TBq was removed, and the new, 145 TBq cobalt-60 source was delivered. This source was transferred in late February to the replacement housing which is an Eldorado 78 therapy treatment head mounted vertically on a custom stand. The facility has been undergoing testing and measurement to enable the calibration capability to be restored.

During the quarter, the kilo-voltage X-ray service was continued and one therapy centre had calibrations done at those qualities. The protection level service calibrated 6 gamma-ray survey meters, 2 neutron monitors, and 9 personal dosimeters.

A NATA review of the Ionizing Radiation Calibration quality system in March resulted in the extension of scope to include neutron monitor calibrations and low energy kilo-voltage X-ray (10 to 50 kV) therapy qualities.

Australian Diagnostic Reference Levels for Computed Tomography

ARPANSA has developed a second draft survey taking into account the concerns raised by the participants in the initial draft survey. Tools have been added for ease of use and practice reports have been updated. The survey has been distributed and a series of dial-in telcos have been arranged for participants to ring in with queries. The survey has been sent to 30 practices for response. The final submission date is 4 June.

ARPANSA has invited the following organisations to be on the National Diagnostic Reference Level Liaison Panel. Organisations : Royal Australian and New Zealand College of Radiologists, Australian Institute of Radiography, Australasian College of Physical Scientists & Engineers in Medicine, Australian Diagnostic Imaging Association, Australian and New Zealand Society of Nuclear Medicine, Australian and New Zealand Association of Physicians in Nuclear Medicine, Department of Health and Ageing and the Radiation Regulators Forum.

ARPANSA is developing the web based version of the survey.

Promoting optimisation in the medical application of ionizing radiation

The development of reference megavoltage X-ray beams (6, 10 and 18 MV) from the Elekta medical standards linear accelerator (linac) has made sufficient progress that it was possible to use the 6 MV beam to provide normalisation exposures for the TLD therapy dosimetry audit program. Three centres were audited over the quarter for a total of 8 beams, including a 6 MV stereotactic radio-surgery beam. All beams were within the +/-3% criteria, consistent with previous beams normalised to the decommissioned cobalt-60 gamma-ray source.

A research submission to International Atomic Energy Agency (IAEA) has been developed for a collaborative project on advanced patient diagnostic radiation dosimetry.

The results of an investigation of alternative chromatographic media to replace the now unavailable Instant Thin Layer Chromatography (ITLC-SG) strips have been published. This information is important to the reliable measurement of the radiochemical purity of radiopharmaceuticals used in nuclear medicine.

PUBLICATIONS

Z Ivanov, R Guilfoyle and I Bokor, *Alternatives to Instant Thin Layer Chromatography-Silica Gel (ITLC-SG) for use in the radiochemical purity measurement of reconstituted "cold-kit" ^{99m}Tc-radiopharmaceuticals*, ANZ Nuclear Medicine, 2010, **41**:6-8.

Protection of individuals from natural sources of radiation

Measurement and assessment capability

ARPANSA participated in proficiency tests for the analysis of gross alpha, gross beta, radium-226, radium-228, uranium (natural) by alpha spectrometry and tritium by liquid scintillation counting. All results were within the acceptance limits.

Digestion methods applicable to a range of environmental samples for subsequent radiochemical separations are being developed, and the automated sequential technique for the separation of polonium, uranium and thorium, developed by ARPANSA, is being extended to the separation and purification of lead, radium and actinium isotopes.

PUBLICATIONS

ML Taylor, LN McDermott, PN Johnston, M Haynes, T Ackerly, T Kron and RD Franich, *Stereotactic fields shaped with a micro-multileaf collimator: Systematic characterisation of peripheral dose*, *Physics in Medicine and Biology*, 2010, **55**:873-881.

M. Madebo, A. Perkins, C. Fox, P. Johnston and T. Kron, *Study of X-ray field junction dose using an a-Si EPID*, *Australasian Physical Sciences and Engineering in Medicine*, 2010, online publication DOI 10.1007/s13246-010-0005-9.

T. Kairn, J. Kenny, S. B. Crowe, A. L. Fielding, R. D. Franich, P.N. Johnston, R. T. Knight, C. M. Langton, D. Schlect and J. V. Trapp, *Technical note: Modelling a complex micro-multileaf collimator using the standard BEAMnrc distribution*, *Medical Physics*, 2010, **37**:1761-1767.

Exposures in uranium mining and NORM industries

ARPANSA has been commissioned to develop, construct and implement The Australian National Radiation Dose Register (ANRDR). The ANRDR involves the collection; storage and auditing of radiological dose histories for uranium industry workers across Australia. Depersonalised test data was received from industry for final testing of the Register.

A Safety Guide for the methods of monitoring, assessing and recording occupational radiation doses in mining and mineral processing has been developed in relation to the ANRDR project. A draft of the Guide was released for public comment on 29 March 2010.

Environmental assessment

ARPANSA visited the Supervising Scientist Division (SSD) in Darwin from 15 to 16 February 2010 to discuss synergies in work programs aimed at improving national capability for environmental assessment in mining. It was agreed that ARPANSA and SSD should work together in this area and that in order to facilitate knowledge sharing between the two agencies a staff exchange was initiated.

A profile article on ARPANSA and its work activities was published in *Australian Physics*, the journal of the Australian Institute of Physics, during the quarter.

PUBLICATIONS

Doering, C., Colmanet, S., *The Australian Radiation Protection and Nuclear Safety Agency*, *Australian Physics*, 2010, **47(1)**:9–13.

Solar Ultra-Violet Radiation

UV INDEX INFORMATION

In February 2010 ARPANSA cooperated with a Cancer Council Victoria study in Melbourne to monitor the effects that real-time UV Index data delivered to mobile phones have on increasing awareness and modifying behaviour among the population. Work continued to increase availability of the UVR data to more mobile phone applications. The ARPANSA ultra-violet radiation (UVR) network continued to provide live UV Index data for display on the ARPANSA web site to more than 65% of the Australian population as well as for the Australian Antarctic stations.

EDUCATION

ARPANSA participated in UV Alert meetings with the Cancer Councils and the Bureau of Meteorology to raise awareness of solar UVR exposure amongst the general public. The UVR Section provided scientific information and UVR data to state and Commonwealth government agencies and to media organisations.

STUDIES

ARPANSA collaborated with the Lighting and Equipment Energy Efficiency Team of the Department of the Environment, Water, Heritage and the Arts (DEWHA) in investigating the UVR emissions from compact fluorescent lamps (CFLs) and their possible effects on people with lupus or other photosensitive conditions. Measurements were completed on low UVR emitting lamps provided by lamp manufacturers. Work commenced on developing a simple, colour coded, way of presenting information to photosensitive people on the UVR and blue-light emissions from CFLs.

A paper on UVR exposures of people with multiple sclerosis resulting from collaboration with the Menzies Centre for Population Health in Hobart was accepted for publication in *Annals of Neurology*. ARPANSA cooperated with the Cancer Council Victoria in investigating two cases of skin cancer that may have been linked to occupational exposure to UVR.

ARPANSA visited the Australian Antarctic Division Davis and Mawson stations to make spectral measurements of solar UVR and to calibrate permanent on-site UVR detectors.

PUBLICATIONS

Simpson, S, Taylor, B, Blizzard, L, Ponsonby A.L, Pittas, F., Tremlett, H, Dwyer, T, Gies, P and van der Mei, I, *Higher 25-hydroxyvitamin D is associated with lower relapse risk in MS*, Annals of Neurology (in Press).

Rachel Neale, Abbey Hamilton, Monika Janda, Peter Gies, Adele C Green, *Seasonal variation in measured solar ultraviolet radiation exposure of adults in Nambour, Queensland*. Photochem Photobiol, 2010, **86**:445-448.

Monitoring and mitigating population exposures to electric and magnetic fields and electromagnetic radiation

Standard for limiting exposure to electric and magnetic fields

ARPANSA completed the draft final Regulatory Impact Statement (RIS) for the proposed *Standard for Limits and Precautionary Measures for Reducing Exposure to Electric and Magnetic Fields – 0Hz to 3 kHz*, including refinement of the estimates of costs and benefits of the Standard. The draft was submitted to the Office of Best Practice Regulation (OBPR) for review and draft responses to comments from OBPR have been prepared. Comments on the draft Standard by members ARPANSA's RHC were considered and further explanation on the precautionary aspects of the Standard was provided to the Committee at its March meeting. The Committee discussed the further work required to complete the Standard and RIS.

Emerging science on health effects of electromagnetic radiation (EMR) and fields

ARPANSA continued to monitor scientific research into possible adverse health effects of exposure to electromagnetic radiation and fields. A selection of scientific papers, considered of most interest to the public, were summarised in a monthly EMR Literature Survey published on the ARPANSA web site. To assist in preparing recommendations about any need to review the current ARPANSA Radiofrequency Exposure Standard, RPS3, ARPANSA continued the collection and categorisation of scientific papers published since the Standard was prepared.

EMR exposure from Mobile Phones and new technologies

Following the completion of measurements on 9 mobile phone base station during 2009, ARPANSA has undertaken planning for site selection and determination of measurement locations for sites to be measured during 2010.

Public Information

ARPANSA continued to provide information to the public, business and government through response to telephone and e-mail enquiries. The possibility of health effects from extremely low frequency electric and magnetic fields produced by electrical infrastructure was the basis of most enquiries, closely followed by concerns regarding mobile phone base stations, handsets and other wireless technologies.

In the reporting period there were 177 313 visits to the ARPANSA web site. The most popular web pages were the educational pages covering the basics of radiation science and factsheets about magnetic and electric fields from powerlines.

Visitors downloaded 33 252 documents predominantly from the ARPANSA Radiation Protection series (RPS) which can be found at www.arpansa.gov.au/Publications/codes/rps.cfm. The Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002) remained the most popular download.

When visitors used the search facility, the two most frequently used search terms were 'radon', 'EMF', 'laser', 'code of practice', 'ionising radiation' and 'background radiation'.

An invitation to comment on the Draft Safety Guide on Methods for Monitoring, Assessing and Recording Occupational Radiation Doses in Mining and Mineral Processing was issued via the web site and new information was added to the web site regarding radiation from devices used for whole body screening of passengers at airports.

Security of sources and response to radiation emergencies

Council of Australian Governments (COAG) recommendations for radiological material

ARPANSA in consultation with other government agencies is developing a policy framework for a security background checking scheme that will apply to radioactive sources. The scheme will support a nationally uniform approach to the security of these materials. Following completion, the policy framework will be implemented as part of each jurisdiction's regulatory arrangements.

ARPANSA has completed development of the National Register for Sealed Radioactive Sources. The register will allow regulatory bodies the opportunity to better monitor the movement of radioactive sources and ensure compliance with security requirements. ARPANSA is now working with jurisdictions to ensure consistency of terms and availability of data with an expectation that data from each jurisdiction will be uploaded when it has been finalised.

Jurisdictions are at different stages in implementing the *Code of Practice for the Security of Radioactive Sources* following completion of licence holder training in 2009. ARPANSA is working with jurisdictions and licence holders on expectations for security plans. It is anticipated that all NSW licence holders dealing with the first and second highest category of sources will have drafted security plans by mid 2010.

Emergency response capability

NATIONAL

ARPANSA chairs the Technical Working Group of the Visiting Ships Panel (Nuclear) (VSP(N)), to provide expert advice on radiation protection and nuclear

safety issues, as part of the Australian contingent to allow visits by nuclear powered warships (NPW). In March 2010, ARPANSA participated in a meeting the VSP(N). ARPANSA maintained a 24 hour radiation emergency duty officer to provide 24 hour access to ARPANSA resources and expertise.

International monitoring network

COMPREHENSIVE NUCLEAR-TEST-BAN TREATY (CTBT) – AIR SAMPLING MONITORING STATIONS

As part of Australia's commitment to the CTBT, ARPANSA continued to operate and maintain radionuclide air monitoring stations at Melbourne, Perth, Townsville, Darwin, and the Cocos Islands, Australia, including two radioxenon analyzer facilities, collocated with the air monitoring stations in Melbourne and Darwin. The two remaining stations to be installed are located at Macquarie Island and Mawson, Antarctica.

In addition to operating the stations, ARPANSA also operates the Australian CTBT Radionuclide Laboratory (CRL), which has the role of testing samples obtained by other monitoring stations. The Laboratory continues to operate under contract to the Preparatory Commission of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).

During January and February 2010, the CRL upgraded the acquisition hardware and software, and returned to service in early February 2010. As a result of these changes the CRL quality manual was re-written, and on 30 March 2010, NATA re-assessed the CRL against ISO17025 and indicated that no corrective actions were required and that the accreditation would continue. No samples were received from CTBTO during this quarter.

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

The origin of a series of atmospheric radioxenon events detected at the monitoring site in Melbourne, Australia, between November 2008 and February 2009 was investigated. Modelling analyses indicated that the events were consistent with releases associated with hot commission testing of the ANSTO radiopharmaceutical production facility in Sydney, Australia. These findings do not have public health implications.

PUBLICATIONS:

Tinker, R., Orr, B., Grzechnik, M., Hoffmann, E., Saey, P., Solomon, S., *Evaluation of radioxenon releases in Australia using atmospheric dispersion modelling tools*, Journal of Environmental Radioactivity, 2010, **101(5)**:353-361.

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

Details of breaches determined by the CEO are shown in Table 1, below.

ARPANSA under its Compliance Policy takes a graded approach to enforcement and takes action commensurate with the safety significance of the breach of the licence conditions and having regard to other factors such as compliance record and responsiveness by the licence holder, particularly in relation to corrective or other action taken to mitigate any safety risks. The outcome of any enforcement action should be the return by a licence holder to a state of compliance.

Table 1: Breaches determined by the CEO for the quarter ended 31 March 2010

Licensee	Number	Nature of breach	Action
ANSTO Radiopharmaceuticals Research Institute	F0044-5C	Licensed activity limit for Ge-68 exceeded on 14 August 2008	No enforcement action was initiated as Licence Holder undertook appropriate corrective measures.
ANSTO Radiopharmaceuticals Research Institute	F0044-5C	Licensed activity limit for F-18 exceeded since September 2007	No enforcement action was initiated as Licence Holder undertook appropriate corrective measures.
Australian Institute of Marine Science	S0007	Failing to submit a quarterly report for the period 1 July to 30 September 2009 within the required time period	No enforcement action taken as the licence holder subsequently submitted the report.
ANSTO OPAL Reactor	F0157	Failing to comply with the Operational Limits and Conditions (OLCs). The breach followed an incident in November 2008 when a faulty instrument power supply was failed to be placed into tripped state.	No enforcement action taken as following the breach of the OLCs the reactor remained in a safe state.

Facilities licensed under Part 5 of the *ARPANS Act*

Details of facilities licensed under Part 5 of the *ARPANS Act* during the March quarter are provided in Table 2 below

Table 2: Facilities licensed under Part 5 of the *ARPANS Act* during the quarter ended 31 March 2010

Licensee	Number	Type	Comment
PetNet	F0211	Operate	Authorise to operate the facility routinely following hot commissioning.

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 did not meet during the quarter, but continued to work out of session to prepare its report on management of intermediate level radioactive waste for completion at the next meeting. Summaries of previous Council meetings are available on the ARPANSA web site at www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm. The next meeting is scheduled for 15 and 16 April 2010.

Radiation Health Committee

The Committee met on the 24 and 25 March 2010 at ARPANSA's Yallambie office. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/rhcmt.cfm.

The key matters discussed included:

- The Committee voted in favour of the inclusion in the National Directory for Radiation Protection of Amendment 5, containing a clarification on the application of ionizing radiation principles to non-ionizing radiation, the adoption of the Veterinary and Chiropractic Codes, and some editorial amendments, and recommended that the CEO propose to AHMAC and Health Ministers that they endorse the amendment.
- The Committee was advised of the remaining work required on the draft *Standard for Limits and Precautionary Measures for Reducing Exposure to Electric & Magnetic Fields – 0Hz-3kHz* and other documents, including the final regulatory impact statement, supporting material, and consultation documents. The final package of documents and a communication strategy for release of the Standard will be prepared for discussion at the July 2010 meeting.
- The Committee agreed (10 of 11 members) to the inclusion of the proposed definition of radioactive waste in the draft *Recommendations for the Classification of Radioactive Waste* and that the draft could progress to Council for approval.
- The Committee agreed to write to the Australian Institute of Radiography and the Australian and New Zealand Society of Nuclear Medicine to encourage the development of national training of Nuclear Medicine Technologists in the use of Computed Tomography for Coronary Angiography (CTCA).
- The Committee agreed that a report be prepared for the July 2010 meeting on the CBRN approach to first responder radiation exposure and on a strategy to promote use of the IAEA First Responders Manual and for first responder training.
- The Committee approved a Project and Document Plan (PDP) to develop a Safety Guide for the design approval of transport packages containing radioactive material.

Nuclear Safety Committee

The Committee did not meet during the quarter. The next meeting is now scheduled for May 2010.

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

No reports from the RHSAC and NSC were provided to the CEO of ARPANSA during the quarter.

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.