RAC

RADIATION ADVISORY COUNCIL

ANNUAL REPORT 2013–14

Published by:
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ISSN 1323–4072
EPA 2014/0857
December 2014

Dr Rob Stokes MP
Minister for the Environment
Minister for Heritage
Minister for the Central Coast
Assistant Minister for Planning

Dear Minister

It is my pleasure to forward to you for presentation to the Parliament of New South Wales the Annual Report of the Radiation Advisory Council for the period 1 July 2013 to 30 June 2014. This report has been prepared in accordance with the provisions of the *Radiation Control Act 1990*.

Yours sincerely

CRAIG LAMBERTON
Chairperson
Radiation Advisory Council

November 2014

Contents

Chairperson's review

The Radiation Advisory Council (the Council) is established under the *Radiation Control Act 1990* (the Act). The Act and the Radiation Control Regulation 2013 (the Regulation) are administered by the Minister for the Environment (the Minister) through the Environment Protection Authority (EPA).

The Council provides advice to the Minister and the EPA on technical and policy matters relating to managing radiation in NSW within the parameters of the Act and the Regulation.

During the reporting period, the Council held five meetings and provided policy and regulatory advice to the EPA on the administration of the Act, the implementation of the Regulation and the new provisions of the Act, and a wide range of radiation matters.

The Council work during the reporting period 2013–14 focused on:

- implementing the remade Regulation and new provisions contained in the Act, specifically:
  - implementing management licence provisions to replace the system of single registrations. The introduction of management licences has significantly reduced red tape for businesses and the regulated community.
  - banning of the commercial use of solaria in NSW from 31 December 2014.
  - implementing the provisions of the national *Code of Practice for the Security of Radioactive Sources*. The code was incorporated into the legislation as part of Australia's counter-terrorism strategy.
  - accreditation of radiation security assessors to assess radiation security plans and transport plans
- review of, and provision of advice to the EPA on, the EPA's radiation compliance and audit program
- giving advice on radioactive ore (and in particular uranium exploration) to NSW Trade & Investment (T&I), the regulator of radioactive ores in NSW.
- the work of the Council's Guideline 6 Committee, specifically the review of *Radiation Guideline 6 – Registration requirements & industry best practice for ionising radiation apparatus used in diagnostic imaging*. The aim of the review is to align the guideline with the new requirements of the Act and to incorporate new technology being used in NSW.
- review of, and input into, national codes and standards developed for inclusion in the National Directory for Radiation Protection (NDRP).
- keeping informed on new and emerging issues in radiation protection by inviting speakers to the Council to give presentations on such topics as:
  - current measures employed by the Australian Customs and Border Protection Services (ACBPS) to detect the inadvertent import or export of radioactive material to or from Australia, and the protocols used when radioactive material is unexpectedly detected
  - challenges arising from the Fukushima nuclear power plant accident.

During the year, the Council continued to provide advice to the EPA on radiation matters in relation to:

- radiation licensing (user and management licences)
- assessment of new radiation related technologies

- assessment of radiation safety courses for licencing and accreditation purposes
- accreditation of consulting radiation experts (CREs)
- accreditation of radiation security assessors
- review of radiation accidents and incidents.

In the year ahead, the Council's work will focus primarily on:

- input into the NDRP
- review of, and contribution to, national codes and standards in the NDRP
- review of the work of the Council's Guideline 6 Committee
- enhancing NSW's capacity to respond to radiation incidents or emergencies.

I sincerely thank all the members of the Council for their contribution and commitment to radiation safety in NSW. I would also like to acknowledge the excellent work of the EPA staff in supporting the Council.

CRAIG LAMBERTON
Chairperson

Responsibilities of the Council

The Radiation Advisory Council (the Council) is constituted under section 29 of the *Radiation Control Act 1990* (the Act).

Objects of the Act

Section 3 of the Act prescribes the objects of the Act as follows:

(a) to secure the protection of persons and the environment from exposure to ionising and harmful non-ionising radiation to the maximum extent that is reasonably practicable, taking into account social and economic factors and recognising the need for the use of radiation for beneficial purposes

(b) to protect security enhanced sources from misuse that may result in harm to people or the environment

(c) to promote the radiation protection principles.

The ***radiation protection principles*** are as follows:

(a) ***justification of a practice*** by assessing that the benefits of the practice involving exposure to ionising radiation outweigh any detriment

(b) ***optimisation of protection*** by ensuring that each of the following is kept as low as reasonably achievable taking into account economic and social factors:

  (i) the magnitude of individual doses of ionising radiation

  (ii) the number of people exposed to ionising radiation

  (iii) the likelihood of exposure to ionising radiation

(c) ***dose and risk limitation*** by setting dose limits or imposing other measures so that the health risk to any person exposed to ionising radiation is kept below levels that are generally considered to be unacceptable.

A person is to take the radiation protection principles into consideration when exercising functions under this Act or under a licence.

Annual report of the Council

Section 33(1) of the Act requires that ‘as soon as practicable after 30 June (on or before 31 December) in each year, the Council is to prepare and forward to the Minister a report of its work and activities for the 12 months ending on 30 June in that year’.

Constitution of the Council

The Council consists of 17 members appointed by the Minister. Those members are:

(a) the Chairperson of the Authority or a member of staff of the Authority, who is to be the Chairperson of the Council

(b) a medical practitioner who is a specialist in radiology

(c) a radiographer with expertise in the field of human diagnostic radiography

(d) a person with expertise in the industrial uses of radiation

(e) a person with expertise in health physics

(f) a medical practitioner who specialises in nuclear medicine

(g) a person with expertise in non-ionising radiation

(h) a person with expertise in work health and safety

(i) a person who is an Australian lawyer of at least 7 years' standing

(j) a person who represents community interests

(k) a person nominated by the Secretary of the Ministry of Health

(l) a radiation oncologist

(m) a medical physicist

(n) an officer of the WorkCover Authority

(o) a person with expertise in naturally occurring radioactivity

(o1) a person with expertise in mine radiation safety

(p) a person chosen by the Minister for such reasons as the Minister thinks fit.

Functions of the Council

Section 30 of the Act prescribes the functions of the Council, namely:

(1) The Council is to advise the Minister on:

(a) proposed amendments to this Act and the making, amendment or repeal of regulations under this Act

(b) the administration of this Act and the regulations

(c) measures to prevent or minimise the dangers arising from radiation

(d) the granting of exemptions authorised by the regulations for periods exceeding 60 days, and

(e) such other matters relating to radiation safety as the Minister considers appropriate.

(2) Any such advice may be given either at the request of the Minister or without any such request.

(2A) The Council may at any time, and must on the request of the Authority, provide advice to the Authority about licences and accreditations under Part 2 of the Act.

(2B) The advice provided to the Authority may be general or specific, as the circumstances require.

(3) The Council has such other functions as are conferred or imposed on it by or under this or any other Act.

The EPA exercises responsibilities and powers under the Act, and the EPA staff of the Hazardous Materials, Chemicals and Radiation Section support the work of the Council.

Meetings of the Council

During the reporting period ending 30 June 2014, the Council met on five occasions. The attendances of members at meetings during this period are shown in Table 1.

TABLE 1
Meeting attendance by members of the Radiation Advisory Council 2013–14

Member	Appointed position	Meetings attended
Mr Craig Lamberton (appointed 16/12/2013)	Chairperson	5
Dr Philip Pasfield (appointed 21/1/2013)	A medical practitioner who is a specialist in radiology	4
Mr Glen Burt (appointed 21/1/2013)	A radiographer with expertise in the field of human diagnostic radiography	5
Mr Brent Rogers (appointed 16/12/2013)Mr Michael Polewski (term expired 1/11/2013)	A person with expertise in health physics Deputy	5
Ms Vanessa Brooks(appointed 16/12/13)	A person nominated by the Secretary of the Ministry of Health	1
Dr Richard Smart (appointed 2/10/2012)	A medical physicist	4
Vacant Mr Mark Moskvitch (resigned 27/11/2013) Ms Colleen Harris (Observer) Mr Jeremy Allan (term expired 1/11/2013)	An officer of the WorkCover Authority Deputy	5 (includes Observer attendance)
Prof. Greg Skilbeck (appointed 2/10/2012)	A person with expertise in naturally occurring radioactivity	5
Assoc. Prof. Lee Collins AM (appointed 2/10/2012)	A person with expertise in non-ionising radiation	4
Mr Jon D'Astoli (appointed 16/12/2013) Ms Karen Wolfe (term expired 1/11/2013)	A person with expertise in work health and safety Deputy	3
Mr Cormack Dunn (appointed 2/10/2012)	A person who is an Australian lawyer of at least 7 years' standing	2

TABLE 1 *continued* Meeting attendance by members of the Radiation Advisory Council 2013–14		
Ms Sarah Jones (appointed 2/10/2012)	A person who represents community interests	3
Dr Elizabeth Bailey (appointed 2/10/2012)	A person chosen by the Minister	3
Dr Hugh Dixson (appointed 21/1/2013)	A medical practitioner who specialises in nuclear medicine	3
Mr Frank Galea (appointed 2/10/2012)	A person with expertise in the industrial uses of radiation	4
Mr Robert McLaughlin (appointed 21/1/2013)	A person with expertise in mine radiation safety	4
Dr Mary Dwyer (appointed 21/1/2013)	A radiation oncologist	4

The Council approved the attendance of Ms Colleen Harris from NSW WorkCover as an observer.

Memorandum of understanding between the EPA and the Council

At its August 2013 meeting the Council reviewed and made minor amendments to the memorandum of understanding (MoU) between the EPA and the Council. The MOU was signed by both parties on 17 September and is provided in Appendix 1.

The Council's strategic direction

The Council at its August 2013 meeting endorsed its strategic direction for 2013–16. The Council's strategic approach over the next 3 years will focus on:

- developing uniform regulatory initiatives through the NDRP by reviewing national codes and standards and identifying regulatory gaps that may need to be addressed
- identifying and addressing emerging issues in radiation protection (in particular, new technology)
- identifying procedures and requirements to prevent or minimise dangers arising from the misuse of radiation materials. The Council will continue to focus on emergency response capabilities through support for, or participation in, multi-agency emergency management exercises and through participation in national programs.

The Council's work

During the reporting period the Council focused on the following matters:

Implementation of the new radiation control legislation provisions

Radiation Control Act 1990

During the reporting period the Council provided advice to the EPA on implementation of the Act's new provisions, which commenced in July 2013. The most significant provisions include the introduction of:

- management licences. This system introduced a single management licence for each organisation; it covers all regulated material (radioactive substances, ionising radiation apparatus and sealed source devices) that an organisation owns or possesses or is storing, selling or giving away (See 'Radiation management licences'.)
- a public register of licensees (The EPA has advised that this is to be created when the new licensing system is in place.)
- requirements for persons responsible for security-enhanced sources[1] to prepare source security plans and source transport security plans, implement security measures for security-enhanced sources, and ensure that certain persons have undergone identity and security checks. These requirements implement the Council of Australian Governments' national requirements for the security of 'security enhanced radioactive sources'.
- accreditation of radiation security assessors to assess security plans. (See 'Radiation security assessors'.)

Radiation Control Regulation 2013

During the reporting period the Council provided advice to the EPA on implementation of the Regulation, which commenced on 1 July 2013. The most significant changes introduced by the Regulation are:

- the Government's ban from December 2014 on the commercial use of solaria for cosmetic tanning. The Council was kept informed of the progress of the Government's proposal to ban the use of commercial tanning units.
- the introduction of a new risk-based fee structure for licensing that also allows implementation of the management licence provisions
- provisions relating to the security of radioactive sources, including requirements for the development of security plans, security transport plans and identity checking
- prescribing that certain functions under the Act are to be exercised by T&I with regard to radioactive ore that is located at any place to which the *Coal Mine Health and Safety Act 2002* or *Mine Health and Safety Act 2004* applies, or at any place where activities that are regulated under the *Petroleum (Offshore) Act 1982* or *Petroleum (Onshore) Act 1991* are carried out.

Mineral exploration. The Council has kept a close brief on matters pertaining to radioactive ore, as a result of certain prior EPA functions under the Act now exercised by T&I. The Council:

- was provided with information on the status of uranium exploration in NSW—specifically, that the NSW Government had passed the *Mining Legislation Amendment (Uranium Exploration) Act 2012*, which lifts the ban on uranium exploration in NSW. (Note: The ban on uranium mining remains in place.)

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[1] A sealed radioactive source (or an aggregation of sealed radioactive sources) that is a category 1, 2 or 3 source is a **security-enhanced source** for the purposes of the Act. Category 1 sources are considered to provide the highest risk and are subject to the most stringent security requirements; they may include industrial irradiation facilities, larger blood or research irradiators and gamma knife devices. Category 2 sources include most blood and research irradiators and industrial radiography sources. Category 3 sources include sources used in brachytherapy and larger fixed industrial gauges.

- was advised that the EPA, in November 2013, had attended the T&I interagency workshop, which was intended to foster a whole-of-government regulatory approach to uranium mineral exploration in NSW
- was advised that the Government was intending to make an announcement in the media inviting interested parties to apply for exploration licences
- considered and provided advice to the EPA on:
  - T&I Mine Safety information fact sheets on uranium exploration
  - the South Australian guidelines *Radiation Protection Guidelines on Mining in South Australia: Mineral Exploration.*

The Council recommended to the EPA that good, clear guidelines are needed to address issues such as disposal and transport. It also recommended that a nationally consistent approach should be used. The Council recommended, taking into account South Australia's extensive experience in uranium exploration, that the South Australian *Radiation Protection Guidelines on Mining in South Australia: Mineral Exploration* be used as the basis for the NSW guidelines. The EPA wrote to T&I recommending that the NSW guidelines be based on those of South Australia.

EPA radiation compliance and audit program

The Council considered:

- the EPA radiation compliance program 2013–14 and the proposed compliance program for 2014–15. The Council recommended that the EPA include compliance testing for high risk industrial radiography equipment.
- the report from the EPA on the EPA's compliance audit program for the disposal of radiation sources. The compliance program was run to investigate whether the conditions of approval to dispose of radioactive substances had been met. The EPA informed the Council that it had identified some minor non-compliance issues relating to notifications and had established a system to deal with potential non-compliances systematically.
- the compliance inspection report compiled by RXNS Pty Ltd of the Environment Science Facility at Lidcombe. The report found that the EPA had met all regulatory requirements. It also identified some measures to improve work health and safety; the EPA has now implemented these measures.

New and emerging issues in radiation protection: presentations to the Council

The Council kept itself informed of new and emerging issues in radiation protection by inviting speakers to address the Council on the following:

- current measures employed by ACBPS to detect the inadvertent import or export of radioactive material to and from Australia, and protocols used when radioactive material is unexpectedly detected. The presentation was provided by Mr Geoff Johannes, National Director Cargo, ACBPS.

  The Council is of the opinion that introducing simple radiation detection equipment at major international cargo entry and exit points would go a long way towards ensuring that such cargo is identified before its inadvertent distribution into the broader community. The EPA forwarded a letter to ACBPS on behalf of the Council offering to work with ACBPS and other relevant agencies to explore strategies for the early detection and subsequent handling of undeclared radioactive material in NSW.

- challenges arising from the Fukushima nuclear power plant accident. The presentation was provided by Dr Carl-Magnus Larsson, CEO of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and Chair of UNSCEAR (the United Nations Scientific Committee on the Effects of Atomic Radiation).

Radiation Health Committee deliberations

The Council was kept up to date and provided comment on the national Radiation Health Committee (RHC) deliberations. The RHC met on three occasions during the reporting period (See 'National uniformity').

Review of International Atomic Energy Agency documents

During the reporting period the Council considered and provided advice to the EPA on the following draft International Atomic Energy Agency (IAEA) documents:

- Draft IAEA Safety Standards: *Preparedness and Response for a Nuclear or Radiological Emergency* (DS457)
- Draft IAEA Safety Standards: *Occupational Radiation Protection: Draft Safety Guide* (DS453)
- Draft IAEA Safety Standards: *Radiation Protection and Safety in Well Logging* (DS419)
- Draft IAEA Safety Standards: *Radiation Protection and Safety in Nuclear Gauges* (DS420).

Advice to the Council

The Council also considered:

- an update from the EPA on the review of the Lucas Heights Emergency Management Plan
- ARPANSA advice to each jurisdiction on the increased risk of eye damage from the operation of intervention fluoroscopy equipment
- a radiation accident reported to the IAEA involving a stolen therapy source (cobalt-60) that was removed from its protective shielding in Mexico
- a report by the American Association of Physicists in Medicine on *Radiation Dose from Airport Scanners*
- an advertisement for health, fitness and beauty industries by Body Boost Bed Pty Ltd: *Body Boost Bed*: *Full Body LED Light Therapy*
- a draft *Review of the potential public health impacts of exposures to chemical and radioactive pollutants as a result of shale gas extraction*, by Public Health England.

Revision of the Council's business documents

The Council revisited its corporate governance arrangements, strategic direction document and MoU following the revision and update of the NSW Department of Premier and Cabinet's (DPC) *NSW Government Boards and Committee Guidelines.* The DPC guidelines were amended to incorporate various NSW Public Service Commission (PSC) guidance documents, including the classification and remuneration framework for NSW boards and committees. The review resulted in the development of the Radiation Advisory Council (RAC) Handbook. The RAC Handbook is a reference source for members of the Council and its committees, the Minister, and staff of the EPA who provide executive or administrative support to the Council.

Council's advice to the EPA on routine matters

During the reporting period the Council continued to provide advice to the EPA in relation to routine radiation matters, including:

- non-standard licensing applications
- radiation safety courses for the purposes of licensing
- new radiation technologies
- non-standard accreditation applications
- radiation accidents and incidents.

Committees of the Council

Under section 31 of the Act the Council may establish committees to help it perform its functions. In 2013–14 the Council had two committees:

- National Directory Committee
- Review of Guideline 6 Committee.

The roles and work of each of the Council's committees are outlined below.

National Directory Committee

The National Directory Committee was established by the Council to help it to develop and implement the NDRP and to ensure that the recommendations proposed by the national RHC are practical and effective in controlling radiation risks to human health and the environment. The RHC advises the CEO of ARPANSA and the Radiation Health and Safety Advisory Council on matters relating to radiation protection, including formulating draft national policies, codes and standards for consideration by the Commonwealth, States and Territories.

The committee's role is to provide advice to the Council and the EPA on the priorities and suitability of material proposed for inclusion in the NDRP, as well as on its legislative, financial and operational impact on the EPA, other NSW Government agencies and NSW as a whole. The committee reviews documents that are produced by the RHC.

The committee did not meet during the reporting period, because the Council considered the deliberations of the RHC directly (see 'National uniformity').

Review of Guideline 6 Committee

The Council established the Guideline 6 Committee to review *Radiation Guideline 6: Registration requirements & industry best practice for ionising radiation apparatus used in diagnostic imaging* (www.epa.nsw.gov.au/radiation/radiationpubs.htm).

The aim of the review is to incorporate new technology and to update the requirements of the six-part guideline to align with the new requirements of the Act. The following are the six parts of the guideline:

Part 1: Mammography

Part 2: Fluoroscopy & radiography

Part 3: Dentistry (including maxillofacial)

Part 4: Veterinary science

Part 5: Computed tomography & bone mineral densitometry

Part 6: Test protocols for parts 2–5.

During the reporting period the committee met on six occasions. The committee provided updates on its progress on the review of the guideline at each Council meeting. The committee had, by 30 June 2014, completed much of the review of the guideline and advised the Council that the revised guideline would be presented to the Council in late 2014.

As part of the review the committee recommended that all CREs undertake appropriate training in new technology and revised practices. On the advice of the committee the Council recommended that, in the next period, the EPA provide a paper to the Council investigating the types of training CREs will need to undertake (specifically, for CREs assessing computed tomography [CT] and digital equipment).

National uniformity

National uniformity for radiation protection is undertaken through the NDRP, which is developed by the RHC and is facilitated by ARPANSA. National uniformity was agreed to at the Australian Health Ministers' Conference (AHMC) in August 1999. This process allows all jurisdictions, including the Commonwealth, to achieve national uniformity for radiation protection through each jurisdiction's radiation protection framework. The first edition of the NDRP was endorsed by the AHMC in May 2005.

Radiation Health Committee

During the reporting period the Council considered and provided comment to the EPA on a number of RHC documents and deliberations presented at the meetings of the RHC:

RHC meeting July 2013

- NDRP Amendment No. 6 covering schedules 5, 6, 9 and 13. Amendments were forwarded to the AHMAC for endorsement.
- Draft ARPANSA document on *Fundamentals: Protection Against Ionising Radiation*. A draft was posted by ARPANSA on 27 June 2013 inviting public comments and submissions by 8 August 2013.
- Draft ARPANSA Code of Practice: *Planned Exposure Situations*
- Draft ARPANSA Safety Guide: *Radiation Protection of the Environment*
- ARPANSA Code of Practice: *Near Surface Disposal*
- Draft ARPANSA Safety Guide: *Radiological Clearance/Closure Criteria and Management of Sites Contaminated as Result of Past and Present Activities.* A project working group has been established to develop the guide, the scope of which will focus on mining,

RHC meeting November 2013

- Draft ARPANSA Fundamentals: *Protection Against Ionising Radiation*

- Draft ARPANSA Code of Practice: *Planned Exposure Situations*
- Draft ARPANSA Safety Guide: *Radiation Protection for the Environment.* The Council was informed that the working group is to include a representative from each jurisdiction.
- Disposal of radioactive material (an amendment to the NDRP). The Council agreed that this matter needed to be considered further in terms of how the document affects current NSW regulatory processes and how the proposed schedule would be applied in the NSW context. The Council suggested that the EPA explore whether a working group needs to be established to consider the matter. (See March 2014 meeting)
- Use of lasers and intense pulsed light for cosmetic purposes. The Council was given an overview of the work of the national working party by Associate Professor Lee Collins, a member of the Council and a member of the national working group as nominated by the Council. Associate Professor Collins gave the Council the working group's proposed four options for the control of cosmetic surgery lasers in Australia. The Council was informed that ARPANSA was in the process of preparing a draft regulatory impact statement that will explore in detail the costs and benefits of each of the four options flagged by the working group.

RHC meeting March 2014

- RHC work program: update on the mapping of Radiation Protection Series (RPS) documents against relevant international publications. It was agreed that, in principle, IAEA publications should be adopted as RPS documents subject to Office of Best Practice Regulation and legislative requirements. It was also agreed that, over time, the RPS should reflect the 13 areas corresponding to the IAEA framework and hierarchy.

- Proposed NDRP amendment on disposal of radioactive material. The EPA consulted individual members of the Council with expertise in this area; their advice was then provided to the Council for consideration. Council noted that the levels proposed for inclusion in the NDRP for disposal of radioactive material without the need to obtain consent from the regulatory authority are below those for a radioactive substance prescribed in the Act and thus will have no impact on NSW. Council noted that although consent is not required to dispose of radioactive material with activity levels below those prescribed in the Regulation, the levels proposed for the NDRP amendment relating to solid waste do trigger the restricted solid waste classification of the NSW Waste Guidelines. This means that although no consent is required to dispose of this type of material in NSW, it can be disposed of only in a facility that is licensed to accept restricted solid waste.

- Draft ARPANSA Safety Guide: *Radiological Clearance/Closure Criteria and Management of Sites Contaminated as a Result of Past and Present Activities.* The RHC agreed that there is a case for action regarding a national closure process and criteria for past and present mining and mineral processing activities. The Council noted that Mr Andrew Mitchell, Manager Hazardous Incidents, NSW EPA was nominated by the EPA to be in the national working group.

Licensing and accreditation

The EPA is the authority responsible for dealing with licensing (user licences and management licences), licensing variations and accreditation applications listed under Part 2 of the Act. The EPA may seek, and take into consideration, the advice of the Council on licensing and accreditation matters. Section 30 of the Act provides that the Council may give generic or specific advice to the EPA on applications under Part 2 of the Act.

During the reporting period the Council advised the EPA on licensing and accreditation matters. The Council's standing advice was taken into account in the EPA's consideration of applications submitted to it under the Act. The Council and the EPA work together on determining the outcomes of applications, as set out in the MoU between the Council and the EPA (see Appendix 1). The Council also considered and reviewed the routine licensing and accreditation statistics provided at each meeting.

An overview of radiation user licences, management licences, accreditation of CREs and accreditation of radiation security assessors is given below.

Radiation user licences

Users of radiation are required to hold a radiation user licence

Section 7 of the Act provides for regulation of the use of regulated material[2] and prohibits a person from using regulated material unless they hold a current licence and comply with its conditions. Clause 10 of the Regulation provides an exemption from section 7 of the Act for specified categories of persons.

Purpose of a radiation user licence

The aim of a user licence is to:

- regulate, restrict or prohibit the use of regulated material
- ensure that persons who use regulated material:
  - are fit and proper persons
  - have appropriate knowledge of the principles and practices of radiation safety and of the protection applicable to the activities proposed to be carried out
- protect the NSW community and the environment from harmful exposure to radiation.

Occupations requiring a user licence

The majority of the licences issued by the EPA are radiation user licences—that is, licences issued to persons that use regulated material. User licences are held by individuals who work across a wide range of occupations in NSW. Occupations requiring radiation user licences include scientist, medical specialist, nurse, radiographer, industrial radiographer, service engineer, technologist, dentist, chiropractor and tertiary lecturer.

Number of user licences issued by the EPA

For the reporting period ending 30 June 2014 the EPA issued 1244 new radiation user licences and renewed 5473 user licences. At the end of the reporting period there was a total of 13,487 radiation user licences (3291 one-year licences and 10,196 three-year licences).

Council's advice to the EPA

The Council gives the EPA specific expert advice in relation to radiation safety and the requirements for licensing across all occupational areas that use radiation. During the reporting period, the Council advised the EPA on the following matters:

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[2] Regulated material means any of the following: radioactive substances, ionising radiation apparatus, non-ionising radiation apparatus of a kind prescribed by the regulations, and sealed source devices.

Non-standard licence conditions. The Council recommended the granting of four non-standard licence conditions to use regulated material:

- S36 licence to use radioactive substances for radiopharmacy
- IA10 licence to use radiation apparatus for installing and/or servicing radiation apparatus
- IA6 licence to use radiation apparatus for industrial radiography
- S6 licence to use radioactive substances for industrial radiography.

Radiation user licence conditions. The Council approved the amendment of the standard licence to use radioactive substances for scientific and research purposes (S8) condition to incorporate additional radionuclides now in common use.

Radiation safety courses. The Council considered and approved the following radiation safety courses for the purpose of licensing:

- Charles Sturt University (CSU) *Bachelor of Medical Radiation Science (Nuclear Medicine)*—including 3 weeks of dedicated clinical diagnostic training in CT (in a facility dedicated to diagnostic CT training)—for the purpose of gaining a radiation licence to use CT apparatus for diagnostic and nuclear medicine purposes (IA16D).

  At its August 2013 meeting the Council recommended that having the degree alone was not enough to be eligible for this licence type. It recommended that CSU require graduates to also undergo 3 weeks of dedicated clinical diagnostic training in CT in a facility dedicated to diagnostic CT training. At its meeting in June 2014 the Council was given a letter from CSU advising that it had included the additional 3 weeks of clinical training in the degree course.

- Australian Nuclear Science and Technology Organisation (ANSTO) radiation safety courses, as listed along with the licence types that the courses were found to be suitable for:
  - *General Radiation Safety Officer Course* (5 days): soil moisture and density gauges (S30); scientific and research purposes (IA8/S8); analytical purposes (IA5); and quality assurance purposes (S12)
  - *Industrial Radiation Safety Officer Course* (5 days): analytical purposes (IA5/S5); borehole logging (IA35/S35); scientific and research purposes (IA8/S8); industrial gauging (S7); installing and servicing of devices containing radioactive material (S10); and soil moisture and density gauges (S30)
  - *Portable Moisture and Density Gauge Course* (3 days): soil moisture and density gauges (S30); analytical purposes (S5); industrial gauging (S7); and installing and servicing of devices containing radioactive material (S10)
  - *Fixed Radiation Gauge Course (3 days)*: industrial gauging (S7) and installing and servicing of devices containing radioactive material (S10)
  - *Borehole Logging Course (3 days)*: borehole logging (IA35/S35).
- Royal Prince Alfred Hospital's *In-house Dispensing and Radiation Safety Procedures in the PET and Nuclear Medicine Hot Labs*, for the purpose of gaining a licence to use radioactive substances for radiopharmacy (S36)
- St Erme Pty Ltd's *Fluoroscopy Radiation Safety Training*, for the purpose of gaining a licence to use radiation apparatus for medical fluoroscopy – specialists other than radiologists (IA22)

- SA Radiation Pty Ltd's *Radiation Safety Fluoroscopic X-ray Units Used for Imaging*, for the purpose of gaining a radiation licence to use radiation apparatus for medical fluoroscopy – specialist other than radiologists (IA22)
- ORP Consultancy Pty Ltd's *Safe Use of Nuclear Type Soil Moisture and Density Gauges*, for the purpose of gaining a radiation licence to use radioactive substances for density/moisture determination (S30).

Licensing of students. The Council considered a request from CSU to licence students who had completed their third year of the 4-year Bachelor of Medical Radiation course in diagnostic radiography or nuclear medicine. The Council requested further documentation, and at its meeting in December 2013 it considered the additional information provided by CSU. The Council did not support this change, as it determined that the students did not have the required level of clinical experience.

Supervision of students using radiation apparatus. The Council considered a request from CSU seeking approval to permit fourth year students to be unsupervised when operating radiation apparatus. The EPA and the Council considered that it was inappropriate to allow students who had not completed their studies to use radiation apparatus for diagnostic radiography without the prescribed level of supervision. A letter was sent from the EPA advising CSU of the Council's decision.

Radiation management licences

Requirement for management licences

Section 6 of the Act provides for persons responsible for regulated material to hold a radiation management licence in respect of the regulated material; they must comply with any condition to which the licence is subject. If the responsible person of the regulated material is a sole trader who also uses the apparatus then they must also have a licence to use that allows them to use the particular regulated material for a specified purpose.

The EPA issues two types of management licence: one to own, store, give away, sell and possess regulated material and the other only for the purpose of selling regulated material.

Introduction of management licences

The introduction of management licences started on 1 July 2013, when the EPA began converting 9658 single registrations to 3143 management licences, thus substantially reducing red tape for both licensees and the EPA.

The Council was kept informed of the consultation process in which the changes from registration to management licences were explained to licensees. At the same time, the EPA informed the Council that from July 2014 it was moving from the Government Licensing System to a purpose-built in-house licensing Permit and Licensing Management System to accommodate all radiation licensing and accreditation activities.

Purpose of management licences

The purpose of the requirement for management licences is to regulate, restrict or prohibit the possession, sale, storage, giving away and disposal of regulated material to secure the protection of the community and the environment from exposure to radiation.

Persons responsible for regulated material

Management licences are issued to persons responsible for regulated material. These are owners of regulated material, persons storing, selling or giving away regulated material and persons in possession of regulated material, other than:

(a) a person who is the holder of a radiation user licence in respect of the regulated material and who has possession of the regulated material only for the purposes of using the regulated material, or

(b) a person who has possession of the regulated material only for the purposes of transporting the regulated material.

Number of management licences issued by the EPA

For the reporting period ending 30 June 2014, the Council was advised that the EPA issued 2729 general management licences and 414 sell only management licences. At the end of the reporting period the EPA had issued a total of 3143 management licences.

Consulting radiation experts

Accreditation and activities of consulting radiation experts

Section 8 (1) of the Act provides for the accreditation of CREs. The Regulation sets out the activities of a CRE, which include:

(a) advising on the design of premises, in relation to radiation safety requirements, on which regulated material is kept or used, for the purpose of certifying compliance with any conditions imposed on a radiation management licence,

(b) assessing plans for premises on which regulated material is kept or used, for the purpose of certifying compliance with any conditions imposed on a radiation management licence

(c) assessing any regulated material and the premises at which it is kept or used, for the purpose of certifying compliance with any conditions imposed on a radiation management licence

(d) assessing the integrity of any shielding of premises at which any regulated material is kept or used, for the purpose of certifying compliance with any conditions imposed on a radiation management licence.

Purpose of accrediting CREs

The EPA accredits CREs to assess apparatus and issue a certificate of compliance verifying that the apparatus complies with the requirements for licensing.

Council's advice to the EPA

Under section 9A of the Act the EPA may seek the Council's advice on accreditation matters. During the reporting period ending 30 June 2014, the Council:

- considered and recommended approval of the *CRE for Diagnostic Imaging (Dental)* training course provided by William Green Pty Ltd, on the proviso that the provider include dental digital imaging equipment in the course

- considered an application for accreditation (dental category). The Council recommended that the applicant be required to attend an interview to be arranged by the EPA to assess whether the applicant had the necessary skills to be accredited in this category. The interview was held and the applicant is now accredited.

EPA seminar for CREs

The Council was advised that the EPA had provided a seminar to CREs on their responsibilities under the new legislative requirements. Several members of Council attended the seminar.

Number of CREs accredited by the EPA

During the reporting period ending 30 June 2014 the EPA issued five CRE accreditations and renewed 35 CRE accreditations. At the end of the reporting period a total of 102 CREs were accredited by the EPA to perform one or more of the prescribed activities.

The Council was given accreditation statistics at each meeting.

Radiation security assessors

Accreditation and activities of radiation security assessors

Section 8(2) of the Act provides for the accreditation of radiation security assessors. The activities of a radiation security assessor, as prescribed in Clause 13 of the Regulation, are:

- reviewing security plans or amended security plans to assess whether the plans are made or amended in accordance with the Act
- endorsing on security plans that the plan, or the plan as amended, satisfies the requirements of the Act.

Purpose of accrediting radiation security assessors

The purpose of accrediting radiation security assessors is to ensure that the persons responsible for security-enhanced sources[3] prepare source security plans and source transport security plans in accordance with the requirement of the Act.

Council's advice to the EPA

The Council at its April meeting was advised that, in the absence of the anticipated scheme of nationally accredited radiation security assessors, the EPA would provisionally recognise candidates selected by ARPANSA to assess radiation security plans in NSW.

At its June meeting the Council was informed that ARPANSA had developed the training course *Vocational Graduate Certificate in Radiation Security* (10009NAT) as a qualification for radiation security assessors. The Council considered and approved the training for the purposes of accrediting radiation security assessors under the Act; it also approved the proposed conditions of accreditation. This approval was subject to the inclusion of a condition that requires the assessor to attend the site where appropriate and to personally undertake the necessary assessments required for approving the relevant security plan. The Council also emphasised that assessors need to avoid conflict-of-interest issues.

[3] A sealed radioactive source (or an aggregation of sealed radioactive sources) that is a category 1, 2 or 3 source is a **security-enhanced source** for the purposes of the Act.

Number of radiation security assessors accredited by the EPA

As at the 30 June 2014 the EPA had accredited a total of five radiation security assessors.

Summary of licences and accreditations issued by the EPA

Table 2 summarises the total numbers of radiation user licences, management licences and accreditations issued by the EPA as at 30 June 2014.

TABLE 2
Summary of the total numbers of active licences and accreditations issued as at 30 June 2014

Category	Number
Licence to use regulated material	13,487
Management licences (general)	2,729
Management licences (sell only)	414
Accreditation of consulting radiation experts	102
Accreditation of radiation security assessors	5
Total	**16,737**

Radiation accidents

Mandatory requirement to report radiation accidents

Clauses 38 and 39 of the Regulation outline the mandatory requirements imposed on a person responsible for regulated material in regard to the reporting and recording of radiation accidents. Clause 37 of the Regulation specifies the types of incidents that are classified as radiation accidents for the purposes of the Act. The Council reviews accident reports at the request of the EPA.

Each year the Council emphasises that it is vital that accidents are consistently reported, even if the dose received has been negligible. This is not just because of the legal requirement, but also because the knowledge gained can be used to develop processes and procedures that reduce the risk of similar accidents occurring in the future. Most reported accidents do not result in any actual harm to an individual.

The Council recommended that the EPA consider measures that would ensure licensees and private radiation facilities are aware of and comply with radiation accident/incident reporting requirements. The EPA is currently investigating such measures**.**

Causes of radiation accidents

The causes of accidents are normally either deficiencies in the relevant management systems or failures on the part of individuals to implement those systems correctly. In cases where investigations reveal that accidents have been caused by a deficiency in the management system, the Council may recommend that new procedures be developed and implemented or that specific regulatory action be taken. Where an individual is at fault, the Council may (if this has not been done by the organisation) recommend counselling or further training to prevent this type of incident from recurring.

Serious accidents reported to the Health Care Complaints Commission (HCCC)

The Council may also recommend that serious health-related accidents be referred to the HCCC. The EPA has standing advice from the Council to refer all matters considered significant by the Council to the HCCC.

Number of accidents reported to the EPA

During the reporting period ending 30 June 2014, the EPA was informed of 41 instances in which radiation accidents may have occurred, involving 48 people.

The Council considered each case and, where appropriate, made recommendations that, in its opinion, would reduce the risk of a recurrence. The EPA also provided the Council with information on 14 incidents that involved doses of less than 1 mSv (milliSieverts) and as such are not included in the accident summary below.

Australian Radiation Incident Register

The Council considered, and provided advice to the EPA on, the summary of radiation incidents reported to the Australian Radiation Incident Register 2012 provided by ARPANSA.

Summary of radiation accidents considered by the Council

All the accidents reported to the Council are summarised below. The summary is grouped by categories of accidents, namely nuclear medicine, therapy, radiology and other.

Nuclear medicine

During the reporting period the Council reviewed the following accidents and the controls instigated by the facilities responsible to correct deficiencies in their standard operating procedures or equipment. The Council was satisfied with the steps the organisations had taken to prevent these types of incident from recurring.

- A patient undergoing a cardiac scan was injected with 947 MBq (megabecquerel) Tc-99m pertechnetate. During the procedure the patient experienced claustrophobia; as a result there was insufficient time for the next phase of the study to be done and the study was cancelled. The patient received an estimated effective dose of 6.6 mSv.
- A patient scheduled for a PET (positron emission tomography)/CT scan had to undergo an additional CT scan, as the automated dispensing system had not given the patient the required dose. The patient received an estimated effective dose of 7 mSv.
- A patient's renal scan was unable to be recovered after a power supply disruption at the facility. The patient received an estimated effective dose of 3 mSv.
- A patient was injected with 200 MBq of Tc99m pertechnetate instead of 200 MBq of Tc99m MAA for a lung scan because the label was not correctly checked. The patient received an estimated effective dose of 2.5 mSv.
- Three patients were injected with Tc99m pertechnetate instead of Tc99m MDP because the MDP cold kit product failed. To remedy such failures the facility is moving to commercially prepared MDP cold kits. The patients each received an effective dose estimated at between 12 and 13 mSv.

- A patient was injected with Tc-99m sestamibi instead of Tc-99m HDP because the wrong radiopharmaceutical was provided by the supplier. The patient received an estimated effective dose of 8.8 mSv.
- An outpatient was referred for a bone scan and a baseline bone mineral density scan. It was later found that the referral was in fact for a DEXA (dual X-ray absorptiometry) examination. The error occurred because the request was incorrectly interpreted and the clinical history of the patient was not checked. The patient received an estimated effective dose of 5.2 mSv.
- A patient was injected with Tc-99m sestamibi for a cardiac perfusion study instead of Tc-99m DTPA for a gated heart-pool scan because the wrong study was ordered. The patient received an estimated effective dose of 5.4 mSv.
- A patient received a bone scan instead of a CT scan because the referral request was not read correctly. The patient received an estimated effective dose of 4.4 mSv**.**
- A patient was given 800 MBq Tc-99m HMPAO for a cardiac study instead of a radiopharmaceutical for a cerebral perfusion study because protocols were not followed. The patient received an estimated effective dose of 7.4 mSv. The Council requested that the facility review the report and recalculate the dose, as it appeared to be incorrect. The facility reviewed the report and the dose was recalculated at 6.08 mSv.
- A patient was injected with Tc-99m sestamibi instead of a radiopharmaceutical for a bone scan because the incorrect radiopharmaceutical was selected. The patient received an estimated effective dose 1.8 mSv.
- A patient was given Tc99m sodium pertechnetate instead of Tc99m sestamibi. The error occurred because the supplier placed the wrong label on the radiopharmaceutical. The patient received an estimated effective dose of 11.5 mSv.
- A patient received an additional thyroid scan because the referral was unclear. The referral had requested a thyroid scan and a follow-up consultation preparatory to I-131 oblation therapy. When the patient presented for the consultation they received a second unnecessary thyroid scan. The patient received an estimated effective dose of 3.6 mSv.
- A patient had a nuclear medicine scan but the radiopharmaceutical kit provided by the supplier failed, resulting in non-diagnostic images being produced. The patient received an estimated effective dose of 3.1 mSv.
- Three patients were injected with fluorodeoxyglucose (18 FDG) but were not scanned owing to equipment failure. One patient received an estimated effective dose of 4.9 mSv and the two other patients each received an estimated effective dose of 4.75 mSv.
- A patient undergoing a bone scan received an estimated effective dose of 4.6 mSv because of a fault in the collimator on the SPECT-CT (single photon emission tomography- CT) machine. A replacement collimator was ordered to replace the damaged one.
- Two patients referred for bone scans each received an estimated effective dose of 1.9 mSv because of CT equipment failure. The scanner was taken out of operation until a service engineer could rectify the problem.
- A patient was injected with 220 MBq of Tc99m DISIDA for a biliary scan. The patient had severe pain and was given a narcotic to ease it; the narcotic affected the scan result. The error occurred because protocols were not followed. The patient received an estimated effective dose of 4.06 mSv.

- A patient was undergoing a gated rest cardiac MIBI scan when the CT scanner stopped half-way through the scan. The patient received an estimated effective dose of 1.4 mSv. Service personnel attended the site and made the necessary adjustments.

Follow-up from the previous period

During the last period the Council considered two separate radiation incidents involving the same supplier of radiopharmaceuticals. As a result of the accidents, Council asked the EPA to investigate the matter further. Following its investigation into these incidents, the EPA issued a number of notices to the supplier requiring them to formally appoint a Radiation Safety Officer and to develop a Radiation Management Plan. The plan was approved by the EPA in January 2014 following a number of revisions recommended by Council.

Therapy

During the reporting period the Council reviewed the following accidents and the controls instigated by the facilities to correct deficiencies in their standard operating procedures. The Council was satisfied with the steps the organisations had taken to prevent these types of incidents from recurring.

- A patient undergoing radiotherapy of the spine received treatment to the wrong area of the spine for the second and third fractions of the treatment. The patient received an estimated effective dose of approximately 8 Gray (Gy) to the spine.
- A patient undergoing radiation therapy to the lung received radiation to a part of the lung that did not require treatment, because shielding that needed to be in place during the treatment was omitted. The dose to the patient's lung tissue was estimated to be 5 Gy. The Council recommended that the EPA request further information from the facility before the Council considered whether the accident should be referred to the HCCC. The Council received the additional information and did not recommend that the accident be referred to the HCCC.
- The wrong patient received a radiation therapy dose to the left hip because of patient misidentification. The patient received an estimated effective dose of 5.22 Gy. The Council recommended that it be given further information, including the results of a root cause analysis (RCA), before it considered whether this accident should be referred to the HCCC. The Council was provided with the RCA results and the additional information requested; it did not recommend that the accident be referred to the HCCC.
- A patient with breast cancer had a lumpectomy and axillary lymph nodes removed. The patient then received unjustifiable radiotherapy treatment to the supraclavicular region. The error occurred because the radiotherapy treatment had proceeded without prior review of the pathology report. The patient received nine out of 25 prescribed fractions, amounting to an estimated effective dose of 18 Gy.

Follow-up from the previous period

In the previous period a patient undergoing a two-phase treatment involving 42.4 Gy received 1.25 Gy of the boost treatment to the wrong breast. The error occurred because of incorrect documentation. The patient received an estimated whole body effective dose of 150 mSv. The Council reviewed the accident and recommended that the EPA require the employer to provide the RCA of the accident. Council also requested that the employer provide details of the actions taken by it to prevent the recurrence of this type of accident. At its October 2013 meeting, the Council was given, and considered, the RCA. It was satisfied with the actions taken by the facility to prevent recurrence of this type of accident.

Radiology

During the reporting period the Council reviewed the following accidents and the controls instigated by the facilities responsible to correct deficiencies in their standard operating procedures. The Council was satisfied with the steps the organisations had taken to prevent these types of incidents from recurring.

- A patient received a CT scan of the brain in error. The error occurred because the scan was ordered for the wrong patient in the electronic records system. The patient received an estimated effective dose of 12 mSv.
- A patient wrongly received a CT scan of the chest owing to patient misidentification. The patient received an estimated effective dose of 13 mSv.
- The wrong patient received a CT scan of the brain because the scan was ordered for the wrong patient in the electronic records system. The patient received an estimated effective dose of 2.7 mSv.
- The wrong patient received a CT scan of the brain because the scan was ordered for the wrong patient in the electronic records system. The patient received an estimated effective dose of 2.1 mSv.
- The wrong patient received a chest and pelvis X-ray because identification protocols were not followed. The patient received an estimated effective dose of 1.2 mSv.
- The wrong patient received a CT of the chest and brain because of patient misidentification. The patient received an estimated effective dose of 11 mSv.
- A patient received an additional CT of the neck because the patient's records were not checked. The patient received an estimated effective dose of 1.8 mSv.
- A patient undergoing palliative care received a CT scan to the upper arm on the wrong side of the body because protocols were not followed. The patient received an estimated effective dose of 4.4 mSv.
- The wrong patient received a CT scan of the sinuses, chest and abdomen because the patient's identity was not checked. The patient received an estimated effective dose of 22 mSv.
- A patient received a CT of the head and the cervical spine instead of a CT of the head because the patient's request form was not interpreted correctly. The patient received an estimated effective dose of 3.6 mSv.
- A patient received a repeat scan of the brain in error because two request forms were raised for the same scan and the notes were not checked. The patient received an estimated effective dose of 2 mSv.
- A patient received an additional CT head scan in error because the request form was not read. The patient received an estimated effective dose of 2.4 mSv.
- A CT scan of the brain was performed on the wrong patient. The error occurred because two patients' electronic records were open and the wrong patient was selected when the order was placed. The patient received an estimated effective dose of 3.4 mSv.
- A CT scan of the abdomen and pelvis was performed on the wrong patient. The error occurred because the wrong information for the patient had been entered into the electronic request system. The patient received an estimated effective dose of 15.8 mSv.
- A patient received a CT scan of the upper thoracic area instead of a CT scan of the pelvis because of an error in the SPECT/CT hybrid gamma camera. The patient received an

estimated effective dose of 1.4 mSv. The Council was advised that the camera was taken out of operation until the manufacturer could review and analyse the logs. The manufacturer provided advice to the EPA that the log had in fact reported multiple warnings that the system had failed. The manufacturer suggested that bedding may have jammed the table; once the jam was released it appears that the previous protocol was overwritten and the CT started to scan from the new landmark. Those involved have received retraining emphasising the correct steps to take if a similar situation reoccurs.

- A patient received a CT scan of the chest, abdomen, and pelvis that was not required because their name was inadvertently placed on the x-rays of another patient. The patient received an estimated effective dose of 28 mSv.

  On reviewing this accident Council recommended that the EPA investigate the matter further, specifically asking the facility for advice on the level of supervision provided to the student who was involved in the accident. The Council also asked the EPA to report back to it with the outcomes of the investigation and on whether any regulatory action was taken. As at 30 June 2014 the EPA was still investigating the matter.

Other

- About 13 GBq of liquid iodine-131 was spilled during routine shipment by a supplier. The spill occurred outside the iodine room where the pot had been placed for collection by the dispatcher. The bottom part of the pot became detached from the lid and fell to the floor, breaking the vial and releasing its contents. The effective dose to the dispatcher and three staff members involved was less than 1 mSv.

  The Council questioned whether staff thyroids were checked and whether the supplier had a thyroid monitoring program. Council requested that a letter be written to the supplier asking it to review its radiation management plan (RMP) requirements to ensure that staff thyroid monitoring had been addressed specifically in the event of an accident.

  The supplier advised that thyroid monitoring was done on the staff involved in the clean-up and that its RMP included thyroid monitoring as routine practice. The Council asked to be provided with the thyroid monitoring results**.**

  After reviewing the results of the thyroid monitoring the Council recommended that, for any future thyroid assessment, the organisation should use a lead castle and collimated probe to improve monitoring accuracy. The Council further recommended that the detector being used should be independently calibrated.

  The Council also recommended that ANSTO should perform an independent assessment of doses. The EPA, on the advice of the Council, wrote to the supplier with the suggested changes to the procedure used by the supplier to assess staff thyroid doses.

- A ute carrying a soil moisture density gauge was stolen. The gauge was locked in safe mode and was in the back of the ute inside a locked metal builder's tool box. The NSW police, ARPANSA and all States and Territory regulatory agencies were informed of the theft. At the time of writing this report the vehicle and the gauge had not been located.

- A 37 GBq americium-241 neutron source became detached from the probe while being used during a geophysical investigation and fell down a borehole. The Council noted the incident and recommended that if the source could not be recovered its presence and location should be added to the section 149 planning certificate of the property. It also recommended that a concrete plinth be erected on the site to indicate that a radioactive source was located below ground level.

Follow-up from the previous period

In the previous period the EPA provided Council with a report on a load of scrap metal shipped to Thailand from Australia and subsequently returned because radiation was detected coming from the inside of the shipping container. When the container arrived back in Australia it was opened and a caesium-137 source was found. The source was believed to be a disused soil moisture density gauge that was consigned as scrap. The Council was also advised that the EPA would investigate the matter in an effort to identify the owner of the source and determine how it came to be exported in the scrap metal.

The EPA advised the Council that, following a comprehensive and detailed investigation that also involved ANSTO, it had failed to identify the owner of the source, because it appeared to have been in use well before registration requirements for such sources were introduced in NSW in 1997. The Council was also advised that the orphan source was consigned for proper disposal by the scrap metal company to an overseas facility.

Categories of radiation accidents reported to the Council from 2008–14

Table 3 summarises the accidents reported to the EPA in specific categories between 2008–09 and 2013–14.

TABLE 3

Categories of accidents reported to the Council between 2008 and 2014

Accident category	Period					
	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Nuclear medicine	14	9	14	4	13	19
Therapy	5	5	4	1	2	4
Radiology	6	10	9	4	12	16
Other	1	0	1	–	1	2
Total	**26**	**24**	**28**	**9**	**28**	**41**

Appendix 1: Memorandum of understanding between the EPA and the Council

Statement of Common Intent

This Memorandum of Understanding has been agreed between the Environment Protection Authority (EPA) and the Radiation Advisory Council (the Council) to document the practical aspects of the way that each will work with the other to advance radiation safety in New South Wales. The EPA provides administrative support to the Council.

Both the Council and the EPA are committed to a cooperative and collaborative partnership with the aim of advancing the objectives of the *Radiation Control Act 1990*. This Memorandum of Understanding shall be reviewed every 3 years and remain in force until such time as both parties agree otherwise.

The roles and responsibilities for each body are set out in the Act. Fundamentally, the Council provides expert advice to the EPA and the Minister for the Environment (the Minister) across all radiation safety matters, whereas the EPA has responsibility for administering the regulatory functions provided by the Act. This Memorandum of Understanding includes an agreement on how advice from the Council will be utilised by the EPA in the details of issuing licences and accreditations.

The Council also has a key role in helping the EPA to develop radiation safety policy for New South Wales. The EPA has responsibility for formally adopting and giving effect to such policies. The EPA must also take into account New South Wales Government policy, any direction from the Minister and other advice it receives in developing and implementing policy. In recognition of the Council's special expertise, the EPA will engage openly, early and in detail with the Council in the development of radiation safety policy matters.

Agreed details of how the Council and the EPA collaborate

1. Development of regulatory guidelines and policies

The EPA will provide the Council with drafts of any new or amended guidelines, policies or standards that are developed or reviewed by the EPA or other external bodies.

The EPA will seek the formal advice of the Council at each stage in the process of the development of these guidelines, policies and standards. This consultation will include the results of any feedback obtained in community consultation processes. The Council will also be formally asked to consider endorsing the final products of the development of guidelines, policies and standards.

2. Provision of advice from the Council to the Minister

Section 30 of the Act gives the functions of the Council in relation to provision of advice to the Minister.

1. The Council is to advise the Minister on:

    (a) proposed amendments to this Act and the making, amendment or repeal of regulations under this Act,

(b) administration of this Act and the regulations,

(c) measures to prevent or minimise the dangers arising from radiation,

(d) the granting of exemptions authorised by the regulations for periods exceeding 60 days,

(e) such other matters relating to radiation safety as the Minister considers appropriate.

2. Any such advice may be given either at the request of the Minister or without any such request.

The Council may also provide advice to the EPA from time to time, as it sees fit and on issues that it considers of relevance, at the request of the EPA or of its own accord.

3. Correspondence

When requested by the Council to prepare correspondence on its behalf, the EPA will present a draft of the correspondence for comment. After amendments to the draft have been prepared in light of the comments offered by the Council, the EPA will submit a final version for endorsement before it is signed by the Chair of the EPA Board.

The time frames for the preparation of drafts and presentation of final versions of correspondence for endorsement by the Council will be managed by the EPA to accommodate the workload of the Hazardous Materials, Chemicals and Radiation Section at the time.

Finalised correspondence that has been mailed out, and correspondence received, will be tabled by the EPA at the next Council meeting, subject to the deadlines for submission of business papers for that meeting.

4. Storage of documents

Records of meetings, including agendas, minutes, and all documents associated with the meetings of the Council, are kept by the EPA. These records will, as far as is possible, be kept in electronic format and will be made available to the members of the Council upon request to the EPA, in a timely manner.

5. Provision of secretariat support

The EPA will provide secretariat support to the Council and all its committees. This support will include:

- preparation of agendas for meetings of the Council and committees, and their distribution to Council members
- taking of minutes and their distribution to members
- preparation of any correspondence requested by the Council.

6. Development of procedures

The EPA and the Council will further develop the system of generic advice for applications to the EPA for licences and accreditations, and the EPA will continue to refer applications not covered by the generic advice to the Council. The EPA will also seek the advice of the Council in regard to radiation accidents and incidents and their investigation, and in regard to the assessment of radiation safety courses.

The EPA will seek active input from the Council on strategic and policy matters. These will include substantive input on any review or development of legislation, with emphasis on the development of standards, codes of practice and guidelines. There will be substantial activity during the development of the National Directory for Radiation Protection.

While recognising that the Council performs an advisory function and that the EPA is the decision maker, the parties agree to work through disagreement as follows:

- There will be an opportunity for discussion, including consideration of the decision-making processes of both the Council and the EPA.
- The EPA will advise the Council if it has formed a view that it intends to make a decision that is inconsistent with the Council's advice; the EPA will provide an opportunity for discussion about the differences.
- The Council may request the EPA to provide an independent facilitator, and the EPA will agree to consider each such request in good faith.
- If the EPA decides to proceed in a manner inconsistent with the Council's advice, it will provide the Council with a written explanation of why it has decided to do so.

7. Determinations for licensing and accreditation

The EPA is the determining authority for applications for licences and accreditations as made under Part 2 of the *Radiation Control Act 1990*. The EPA is empowered by section 9(8) of the Act to seek and take into consideration the advice of the Council on such matters.

Section 30 (2A and 2B) of the Act empowers the Council to provide advice to the EPA on Part 2 applications at any time and requires the Council to do so when so requested by the EPA. The advice provided by the Council may be generic or specific, as the circumstances require.

The Council has provided the EPA with generic advice on Part 2 applications. This advice, known as 'standing advice', is recorded at Schedule 2 of the Council's Corporate Governance and Operating Procedures manual. It is the duty of the EPA to maintain the standing advice in Schedule 2 up to date. Part 2 applications that are fully covered by the standing advice at Schedule 2 are known as 'routine applications'. Part 2 applications that are not covered, or are only partly covered, by the standing advice are known as 'non-routine applications'.

Before an officer with the delegated authority to do so determines a Part 2 application, she or he must have regard to the relevant requirements of Part 2 of the Act, the Radiation Control Regulation 2013, and the standing advice of the Council.

Unless the CEO of the EPA has agreed in writing to the following procedure being varied, the officer:

- may approve any routine application without first seeking the specific advice of the Council on the application, but
- before approving any non-routine application must seek and take into consideration the advice of the Council on the application, and
- before refusing any application must seek and take into consideration the advice of the Council on the application.

Normally the CEO of the EPA will approve a variation in this procedure only in an emergency, in which case the concurrence of the Council with the determination is to be sought retrospectively as soon as practicable.

BARRY BUFFIER
CEO Environment Protection Authority (EPA)

CRAIG LAMBERTON
Chairperson
Radiation Advisory Council

The MoU was signed by both parties on 17 September 2013.

Appendix 2: Membership of committees of the Council during 2013–14

National Directory Committee	
Member	**Membership category**
Dr Richard Smart	Medical physicist
Mr Jon D'Astoli	Work health and safety
Dr Philip Pasfield	Radiologist
Dr Mary Dwyer	Radiation oncologist
Mr Lee Collins	Expert in non-ionising radiation
Mr Frank Galea	Expert in industrial uses of radiation
Mr Len Potapof	EPA (Hazardous Materials, Chemicals and Radiation Section)

Review of Guideline 6 Committee	
Member	**Membership category**
Mr Lee Collins	Expert in non-ionising radiation
Dr Philip Pasfield	Radiologist
Mr Glen Burt	Diagnostic radiographer
Dr Richard Smart	Medical physicist
Mr Paul Cardew	Expert outside RAC – medical physicist
Ms Tiffany Chiew	Expert outside RAC – radiographer
Dr Jennifer Diffey	Expert outside RAC – medical physics specialist (radiology)
Dr Ravinda Grewald	Expert outside RAC – medical physics specialist (radiology)
Mr Peter Williams	EPA (Hazardous Materials, Chemicals and Radiation Section)

Acronyms and abbreviations

ACBPS	Australian Customs and Border Protection Services
AHMC	Australian Health Ministers' Conference
ANSTO	Australian Nuclear Science and Technology Organisation
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
CRE	consulting radiation expert
CT	computed tomography
DPC	NSW Department of Premier and Cabinet
EPA	Environment Protection Authority
Gray	Gy
HCCC	Health Care Complaints Commission
IAEA	International Atomic Energy Agency
MBq	megabecquerel
MoU	memorandum of understanding
mSv	milliSievert
NDRP	National Directory for Radiation Protection
PET	positron emission tomography
PSC	NSW Public Service Commission
RAC	Radiation Advisory Council
RCA	root cause analysis
RHC	Radiation Health Committee (National)
RMP	radiation management plan
RPS	Radiation Protection Series
T&I	NSW Trade & Investment