The Hon. Robyn Parker MP
Minister for the Environment
Minister for Heritage

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 2012 to 30 June 2013. 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 2013
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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 2003 (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 four meetings and provided policy and regulatory advice to the EPA on the administration of the Act, the implementation and remake of the Regulation, and a wide range of radiation matters.

The Council saw the fruition of its major work, the remake of the Radiation Control Regulation, on 13 February 2013. The Council’s contribution to the Radiation Control Regulation 2013 sees the introduction of new initiatives that commence on 1 July 2013. These include:

- implementation of management licence provisions (introduced as part of the 2010 Amendment Act), which will significantly reduce red tape for businesses and the regulated community without compromising radiation safety
- the banning of commercial use of solaria in NSW from 31 December 2014. As part of the process of banning the use of solaria the Government has introduced the UV Tanning Units Disposal Scheme. The scheme provides owners of tanning units at EPA-registered solaria businesses with free collection and disposal of tanning units.
- incorporation of the national Code of Practice for the Security of Radioactive Sources into legislation as part of Australia’s counter-terrorism strategy; the code includes the introduction of measures to physically secure high-risk radioactive sources from deliberate misuse or harm and introduces the requirement for the person responsible for those sources to prepare source security plans and source transport security plans.
- introduction of a new risk-based licensing fee structure that recognises the higher regulatory costs associated with higher risk activities.

The Council met with Mr Barry Buffier, CEO and Chair of the EPA, at its April 2013 meeting. Mr Buffier discussed the work of the EPA, its strategic direction and the importance of the Council’s work to the EPA in relation to radiation protection. Mr Buffier expressed his thanks to members of the Council for their valuable time and contribution to the work of the Council, specifically acknowledging the remake of the Regulation.

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

- radiation licensing, registration, and accreditation of consulting radiation experts (CREs)
- assessment of new technologies relating to radiation
- assessment of radiation safety courses for the purposes of licensing
- the review of radiation accidents and incidents.
In the year ahead, the Council’s work will focus primarily on:

- overseeing the implementation of provisions of the *Radiation Control Amendment Act 2010*, specifically the introduction of management licences and removal of ‘red tape’
- overseeing the implementation of the new Regulation, specifically implementation of the ban on solaria and the national Code of Practice for the Security of Radioactive Sources
- input into the National Directory for Radiation Protection
- review of, and contribution to, national codes and standards arising from the national uniformity process
- 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).

The object of this Act is to:

… secure the protection of persons and the environment from exposure to harmful ionising and 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.

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 Director General or a member of staff of the Authority, who is to be the Chairperson
(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 occupational health and safety
(i) a person who is a legal practitioner of at least 7 years’ standing
(j) a person who represents community interests
(k) an officer of the Department 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.
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, registrations 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 2013, the Council met on four occasions. The attendances of members at meetings during this period are shown in Table 1.

The memorandum of understanding (MoU) between the Council and the EPA is provided in Appendix 1. The Council reviewed the MoU at its June 2013 meeting.
1 Structural changes within the NSW Health portfolio required an amendment to the Act, i.e. the position of ‘An officer from the Department of Health’ was replaced with ‘a person nominated by the Director-General of the Ministry of Health’. This change will commence on 1 July 2013. Because of these changes, Dr Broome has attended meetings of the Council on behalf of the NSW Ministry of Health. His attendance has therefore been included in Table 1.
During the reporting period the Council continued to focus on its strategic direction 2009–2012 by:

- developing uniform regulatory initiatives, through the National Directory for Radiation Protection, by reviewing national codes and standards and identifying regulatory gaps that may need to be addressed
- reviewing the regulatory model for radiation control in NSW to ensure that an efficient and effective regime for controlling the risks to human health and the environment is in place. A particular focus was the remake of the Radiation Control Regulation 2003; the remake aims to reduce red tape and duplication and considers a more outcomes-based legislation while accommodating national uniformity requirements.
- 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.

At its June 2013 meeting the Council commenced deliberations on its strategic direction for 2013–2016.

### The Council’s work

During the reporting period the Council focused on:

- overseeing the remake and implementation of the new Regulation
- providing advice to the EPA in relation to routine radiation matters such as:
  - non-standard licensing applications
  - radiation safety courses for the purposes of licensing
- non-standard registration and accreditation applications
- review of radiation accidents.

In addition to performing its routine work, the Council:

- kept itself informed on new and emerging issues in radiation protection through the following presentations:
  - ‘Maladministrations in nuclear medicine in Australia: lessons from the ARPANSA [Australian Radiation Protection and Nuclear Safety Agency] incident register’. Provided by Dr George Larco, Acting Professor and Clinical Associate Professor, Sydney Medical School, University of Sydney, and Senior Staff Specialist, Department of Nuclear Medicine & Ultrasound and Centre for Biomedical Imaging, Research & Development, Westmead Hospital. (See ‘Radiation accidents’ for further information.)
  - ‘A national diagnostic reference level CT [computed tomography] survey’. Provided by Mr Anthony Wallace, Manager Diagnostic Imaging & Nuclear Medicine, ARPANSA. Mr Wallace provided Council members with an overview of his findings from the ARPANSA National Diagnostic Reference Level CT Survey.
  - ‘Radiation aspects of the NSW mining industry’. Provided by Mr Robert McLaughlin, Inspector of Mines, NSW Trade & Investment, and a member of Council. Mr McLaughlin gave Council members an overview of a research study undertaken by ARPANSA on naturally occurring radioactive material in NSW mines.
  - ‘Radiological contamination in stainless-steel products in NSW’. Provided by the EPA. The Council at its June 2013 meeting included in its strategic direction 2013–2016 a future project that would consider better tracking of sources.
  - ‘Radiation security: the NSW experience’. Provided by the EPA.
  - An overview of the EPA 2012–2013 radiation audit and compliance program. Provided by the EPA.

- considered and provided advice to the EPA on the following papers:

The Council considered both papers and the potential risks of radiation exposure to sewage workers and confirmed that the advice provided by the Council in 2007 at the request of the then NSW Health Department was still current.

- considered the following articles:
  - Doctors jailed in French radiation scandal (AAP January 31 2013). A French court sentenced two doctors and a radiophysicist to 18 months in prison each for their roles in radiation overdoses that killed at least 12 people and left dozens seriously ill. Overdoses were given to nearly 450 cancer patients at the Jean Monnet hospital in Epinal in north-eastern France between 2001 and 2006.
  - a British Medical Journal paper: Research – Cancer risk in 680 000 people exposed to computed tomography scans in childhood or adolescence: data linkage study of 11 million Australians (Mathews JD et al., British Medical Journal 2013; 346:f2360)
− the Royal Australian and New Zealand College of Radiologists’ response to the Matthews et al. study on Cancer risk in 680 000 people exposed to computed tomography scans in childhood or adolescence: data linkage study of 11 million Australians
− An Extract from Vogue: ASOS withdraws radioactive products

was provided with advice on and considered:
− the review of the Lucas Heights Emergency sub plan
− the Hunter’s Hill site remediation environmental assessment. The Council was informed that the assessment had been completed and was open for public consultation from November 2012 to February 2013.
− the progress made by ARPANSA in developing suitable training courses for persons to gain accreditation as radiation security assessors (to assess radiation security plans). ARPANSA advised the EPA that it will provide a list of eligible individuals by July 2013 in lieu of the accreditation of specific training.
− the proposed expansion of the radiation waste facility at ANSTO (the Australian Nuclear Science and technology Organisation). The Council asked the EPA to keep it updated on the matter.

Committees of the Council

Under section 31 of the Act the Council may establish committees to help it carry out its functions. In 2012–13 the Council had two committees:

• National Directory Committee
• Review of Guideline 6 Committee.

The role and work of each of the Council’s committees are outlined below.

National Directory Committee

The Council established the National Directory Committee to help the EPA to develop and implement the National Directory for Radiation Protection and to ensure that the recommendations proposed by the national Radiation Health Committee (RHC) are practical and effective in controlling radiation risks to human health and the environment.

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 National Directory for Radiation Protection, 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 Chair, at the Council’s April 2013 meeting, sought nominations from new members for membership to this committee.

Review of Guideline 6 Committee

The Council has decided to establish a 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 contents of the guideline are defined in clause 11 of the Regulation as applicable requirements for registration of ionising radiation apparatus.
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 *Radiation Control Amendment Act 2010*. The guideline comprises the following 6 parts:

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.

As the review of Guideline 6 flows logically from the remake of the Regulation, the Committee will begin its work now that the Regulation has been remade. At its June 2013 meeting the Council endorsed the committee’s membership and terms of reference.

**Review of radiation control legislation**

*Radiation Control Act 1990*

Elements of the *Radiation Control Amendment Act 2010* passed by Parliament in October 2010 that could not commence at that time are to commence in July 2013, with the exception of some provisions relating to the security of radioactive sources [s14B(2) and (4)].

The new provisions include the introduction of:

- management licences. The system of individual radiation registrations is replaced by a single management licence for each organisation to cover all regulated material held in its possession. The introduction of management licences will markedly reduce red tape.
- a public register for licences
- requirements for persons responsible for security-enhanced sources\(^2\) 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.

During the reporting period the Council provided advice to the EPA on implementation of the requirements of the *Radiation Control Amendment Act 2010*.

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\(^2\) 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.
Radiation Control Regulation 2013

During the reporting period the Council provided advice on, and was kept informed of, the progress of the remake of the Regulation, which was made on 13 February 2013 and is due to commence on 1 July 2013.

The most significant changes introduced by the Regulation are:

- the Government’s proposal to ban the commercial use of solaria for cosmetic tanning from December 2014
- the introduction of a new risk-based fee structure for licensing that also allows implementation of the management licence provisions (introduced as part of the 2010 Amendment Act)
- provisions relating to the security of radioactive sources (i.e. security plans, security measures, and identity checking)
- prescribing that certain functions of the Authority under the Act are to be exercised by NSW Trade & Investment 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.

During the reporting period the Council provided advice to the EPA on implementation of the Regulation, specifically in relation to the introduction of management licences.

Licensing, registration and accreditation

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

During 2012–13, the Council provided advice to the EPA on licensing, registration 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’s advice on each of these areas is provided below.

Licences to use, possess and sell radioactive substances and radiation apparatus

Section 6 of the Act provides for regulation of the use and sale of radioactive substances and radiation apparatus. Section 6(2) prohibits a person from using, selling or possessing radioactive substances or radiation apparatus unless that person holds a current licence and complies with its conditions. Clause 8 of the Regulation provides an exemption from section 6 of the Act for specified categories of persons.

The aim of licensing is to regulate, restrict or prohibit the use, sale and possession of radiation apparatus and radioactive substances, to ensure that persons are competent in the safe use
of ionising and non-ionising radiation, and to protect the NSW community and the environment from harmful exposure to radiation.

The majority of the licences issued by the EPA are radiation user licences, that is, licences issued to persons that use radioactive substances and radiation apparatus. These licences are held by individuals who work across a wide range of occupations in NSW. Occupations requiring radiation licences ‘to use’ include scientists, medical specialists, nurses, radiographers, industrial radiographers, service engineers, technologists, dentists, chiropractors and tertiary lecturers. The EPA also issues licences to ‘sell and/or possess’ to companies that sell and/or possess radioactive substances and radiation apparatus in NSW.

The Council provides the EPA with specific expert advice in relation to radiation safety and the requirements for licensing across all occupational areas that use radiation. Licensing of individuals and companies aims to ensure that those that use, sell and/or possess radiation apparatus and radioactive substances meet certain minimum standards of expertise appropriate to the activities they undertake when using radioactive substances or radiation apparatus.

During the reporting period, the Council:

- considered and recommended the granting of the following 10 non-routine licences:
  - 4 x licences to use radioactive substances for scientific or research purposes (S8)
  - 2 x licences to use radiation apparatus for scientific or research purposes (IA8)
  - 1 x licence to use radiation apparatus for radiation oncology physics (IA29S Tier 2)
  - 1 x licence to use radioactive substances for radiation oncology physics (S29S Tier 2)
  - 1 x licence to use radiation apparatus for audit, calibration, storage and emergency response as an authorised officer appointed under the Act (IA50)
  - 1 x licence to use radioactive substance for audit, calibration, storage and emergency response as an authorised officer appointed under the Act (IA50).

- considered a draft radiation safety manual submitted by Global Medical Solutions Australia Pty Ltd (GMS). The EPA had issued GMS with a notice to prepare a radiation safety manual (RSM) following a number of reportable incidents and accidents. The Council determined that the draft manual was insufficient for the purpose required and supported the EPA’s recommendation to issue GMS with a notice requiring it to appoint a radiation safety officer (RSO) under the provision of clause 30 of the Regulation in order to help develop an RSM. The EPA issued two notices to GMS, among other things requiring GMS to appoint an RSO and to have its radiation safety management plan reviewed by the appointed RSO by 31 July 2013.

- was advised that the EPA was now using the Australian Health Practitioner Regulatory Agency Board registration requirements in the areas of diagnostic radiography, nuclear medicine technology and radiation therapy for licensing purposes

- was advised that the Australasian College of Physical Scientists & Engineers in Medicine certification in medical physics (radiation oncology) was included on the criteria list of the IA29 licence ‘to use radiation apparatus for radiation oncology physics’ as a criterion for eligibility to gain that licence type

- endorsed the criteria for gaining a radiation licence to use radioactive material for radiopharmacy (S36), provided that this licence type be granted on a case-by-case basis, given the different types of work that can be undertaken under this licence condition
• endorsed the amended existing conditions and the newly proposed conditions of licence for radiographers, nuclear medicine physicians, nuclear medicine technologists and radiologists to perform diagnostic CT procedures.

• considered and approved the following radiation safety courses for the purposes of licensing:
  - **Victorian Society of Nuclear Medicine Technologists diagnostic CT for molecular imaging course** for the purposes of licensing radiographers, nuclear medicine technologists, nuclear medicine physicians and radiologists to perform diagnostic CT procedures
  - **Radiation safety officer courses** provided by ANSTO. Council members considered the 3- and 5-day RSO courses conducted by ANSTO to be appropriate for authorised officers appointed under the Act to gain IA50 and S50 licence conditions to use radiation apparatus and radioactive substances for audit, calibration, storage and emergency response
  - **GEMS PETtrace cyclotron applications training** provided by GE Healthcare for the purposes of licensing individuals to:
    - use radiation apparatus for production of radionuclides
    - use radiation apparatus for installing and/or servicing radiation apparatus
    - use radioactive substances for installing and/or servicing devices containing a radioactive substance.

• considered the options provided by the EPA for licensing radiography students undertaking clinical practice in their fourth year of study. The Council recommended that the current arrangements remain in place until certain issues relating to course content, length and student supervision are further explored.

• recommended that the EPA explore the issue of continuing professional development (CPD) for licensees in areas where there are no professional associations or where rigorous requirements for CPD are not in place

• received statistics on routine licences issued during the year ending 30 June.

For the reporting period ending 30 June 2013, the Council was advised that the EPA issued 1445 new licences, including 79 licences for sale and/or possession and 1366 licences to use radiation apparatus and/or radioactive substances, or both. The total number of new licences (1445) is the number of actual individual new applications that resulted in a licence being issued.

Table 2 lists the numbers of authorisations (licence conditions) issued by occupational category. As a licence may contain more than one condition, the total number of licence conditions issued for radioactive substances and ionising radiation apparatus is greater than the number of actual licences issued.
### TABLE 2
Number of new licence conditions issued in 2012–13, listed by licence category

<table>
<thead>
<tr>
<th>Occupational category</th>
<th>To use radioactive substances</th>
<th>To use ionising radiation apparatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditing and quality assurance work</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Analytical work</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Bone mineral analysis and body composition analysis work</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>Chiropractic work</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>Dental</td>
<td>0</td>
<td>230</td>
</tr>
<tr>
<td>Educational and demonstration work</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Industrial and other related work</td>
<td>204</td>
<td>136</td>
</tr>
<tr>
<td>Installation and servicing work</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td>Medical – nuclear medicine work</td>
<td>33</td>
<td>26</td>
</tr>
<tr>
<td>Medical – physics work</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Medical – radiation therapy work</td>
<td>56</td>
<td>59</td>
</tr>
<tr>
<td>Medical – radiography radiology/fluoroscopy work</td>
<td>0</td>
<td>390</td>
</tr>
<tr>
<td>Medical diagnosis work</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Radiopharmacy work</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Scientific and research work</td>
<td>34</td>
<td>7</td>
</tr>
<tr>
<td>Sell or possess</td>
<td>34</td>
<td>71</td>
</tr>
<tr>
<td>Veterinary work</td>
<td>0</td>
<td>153</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>408</strong></td>
<td><strong>1257</strong></td>
</tr>
</tbody>
</table>

**Note:** The option of a 3-year licence was introduced in September 2007.
During 2012–2013 the EPA renewed 4463 licences. At the end of the reporting period there were 13,494 active licences.

Table 3 summarises the numbers of new licence conditions issued by the EPA during the period 2008–09 to 2012–13.

<table>
<thead>
<tr>
<th>Period</th>
<th>Radioactive substances</th>
<th>Radiation apparatus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2008–June 2009</td>
<td>1006</td>
<td>2800</td>
<td>3806</td>
</tr>
<tr>
<td>July 2009–June 2010</td>
<td>447</td>
<td>1195</td>
<td>1642</td>
</tr>
<tr>
<td>July 2010–June 2011</td>
<td>529</td>
<td>1182</td>
<td>1711</td>
</tr>
<tr>
<td>July 2011–June 2012</td>
<td>572</td>
<td>1489</td>
<td>2061</td>
</tr>
<tr>
<td>July 2012–June 2013</td>
<td>408</td>
<td>1257</td>
<td>1665</td>
</tr>
</tbody>
</table>

Registration of radiation apparatus, sealed source devices and premises

Section 7 of the Act requires the registration of sealed source devices (SSDs)\(^3\) and certain prescribed radiation apparatus. Section 8 of the Act requires those premises where radioactive substances not contained in an SSD are kept or used to be registered.

The purpose of registration is to:

- enable the regulatory authority to place best practice requirements on the operation and maintenance of radiation apparatus, SSDs and radioactive substances, including the design and construction of premises where radiation apparatus, SSDs and radioactive substances are kept or used
- enable up-to-date records to be kept on all SSDs, certain radiation apparatus, and premises where radioactive substances are kept or used, to ensure that these items are controlled safely from cradle to grave
- allow the regulatory authority to restrict the use of apparatus, SSDs and radioactive substances to pre-agreed practices or activities that ensure that the protection of individuals and the environment is optimised.

During the reporting period the Council was provided with, and considered, statistics for routine registrations issued by the EPA during the year ending 30 June 2013.

Table 4 lists the items that are required to be registered with the EPA and their registration commencement dates.

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\(^3\) Under the Act, **sealed source device** means equipment or a gauge, instrument or device that contains a sealed radioactive source and permits the controlled emission of radiation, but does not include a container used solely for the storage or transport of a sealed radioactive source.
A summary of each registration category and the number of registrations in each category is provided below.

**Registration of diagnostic imaging apparatus**

Registration for diagnostic imaging apparatus is valid for 2 or 5 years, depending on the type of apparatus, as shown in Table 5.

<table>
<thead>
<tr>
<th>Category</th>
<th>Duration of registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental radiography (fixed and mobile)</td>
<td>5 years</td>
</tr>
<tr>
<td>Radiography (fixed and mobile)</td>
<td>5 years</td>
</tr>
<tr>
<td>Fluoroscopy (fixed and mobile)</td>
<td>2 years</td>
</tr>
<tr>
<td>Radiography/fluoroscopy (fixed and mobile)</td>
<td>2 years</td>
</tr>
<tr>
<td>Mammography (fixed and mobile)</td>
<td>2 years</td>
</tr>
<tr>
<td>Computed tomography (CT) (includes dental apparatus classified as CT)</td>
<td>2 years</td>
</tr>
<tr>
<td>Panoramic radiography (with/without cephalometry)</td>
<td>5 years</td>
</tr>
<tr>
<td>Bone mineral densitometry</td>
<td>5 years</td>
</tr>
</tbody>
</table>

During the year ending 30 June 2013, the EPA issued 752 new registrations for diagnostic imaging apparatus (Table 6). Table 6 also summarises the number of new diagnostic imaging apparatus registered with the EPA between 2008–09 and 2012–13.
As at the 30 June 2013 the total number of diagnostic imaging apparatus registered with the EPA was 8251.

Diagnostic imaging apparatus is registered with the EPA to ensure that it complies with safety standards and so that the EPA knows what equipment is being used, where it is located, and who owns it. Registration and periodic testing of diagnostic imaging apparatus promote best practice and help to minimise the exposure of patients, occupationally exposed persons and the general public to harmful radiation.

Registration of cyclotrons

Cyclotrons are prescribed in the Regulation as radiation apparatus and are required to be registered every 2 years.

As at 30 June 2013, there were two cyclotrons registered in NSW.

Registration of therapy apparatus

The Regulation requires that radiation apparatus used, or intended to be used, for radiotherapy or radiotherapy planning purposes must be registered. Radiotherapy apparatus is required to be registered every 2 years.
During the year ending 30 June 2013, the EPA issued 11 new registrations for therapy apparatus (Table 7). Table 7 also summarises the number of registrations for each type of therapy apparatus issued by the EPA between 2008–09 and 2012–13.

**TABLE 7**

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilovoltage therapy X-ray (superficial or orthovoltage or both)</td>
<td>3</td>
</tr>
<tr>
<td>Linear accelerator</td>
<td>7</td>
</tr>
<tr>
<td>Simulator</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>

As at the 30 June 2013 a total of 88 therapy apparatus were registered with the EPA.

The use of therapy apparatus has overall societal benefit, but there are high radiation doses involved with therapeutic exposures; these have the potential to also cause harm to those who benefit from the treatment, and to health care staff and members of the public if inadvertent radiation exposure occurs. The EPA registers therapy radiation apparatus for reasons of public safety, setting requirements on the operation and maintenance of radiation apparatus, and to restrict the use of apparatus to optimise the protection of individuals and the environment.

**Registration of sealed source devices**

The Regulation requires SSDs to be registered. SSDs must be registered every 2 years.

During the reporting period, the EPA registered 94 new SSDs (Table 8). Table 8 also summarises the number of new registrations of SSDs issued by the EPA between 2008–09 and 2012–13.

An SSD is a gauge, instrument or device that contains a sealed radioactive source that permits the controlled emission of radiation. Sealed sources within devices are commonly used to deliver a defined dose of radiation, such as those used in cancer therapy; irradiators that sterilise blood products; specialised industrial devices used for measuring the moisture content of soil and for measuring density or thickness of materials; gamma radiography to check welds on pipelines; borehole logging sources used to explore for coal, oil, and natural gas. Sealed radioactive sources within devices, when used as intended, are designed to limit radiation exposure to users. Some SSDs may produce a potentially lethal amount of radiation if used improperly.

The EPA registers these devices to ensure that they comply with specified minimum standards which aim to optimise the protection of individuals and the environment from exposure to ionising radiation; and to keep up-to-date records of ownership and location of the sealed sources contained within SSDs to ensure that safe use, storage and disposal occurs.
### TABLE 8
Numbers of new sealed source devices registered between 2008–09 and 2012–13

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borehole logging</td>
<td>3</td>
</tr>
<tr>
<td>Soil moisture density and moisture determination</td>
<td>103</td>
</tr>
<tr>
<td>Density gauge</td>
<td>1</td>
</tr>
<tr>
<td>Neutron probe</td>
<td>31</td>
</tr>
<tr>
<td>Industrial radiography</td>
<td>25</td>
</tr>
<tr>
<td>XRF analyser</td>
<td>3</td>
</tr>
<tr>
<td>Portable gauge</td>
<td>2</td>
</tr>
<tr>
<td>Beta backscatter thickness testing</td>
<td>1</td>
</tr>
<tr>
<td>Self-shielded irradiator</td>
<td>4</td>
</tr>
<tr>
<td>Therapy device</td>
<td>6</td>
</tr>
<tr>
<td>Analyser</td>
<td>1</td>
</tr>
<tr>
<td>Nuclear medicine gamma camera</td>
<td>1</td>
</tr>
<tr>
<td>Fixed radiation gauges</td>
<td>109</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>290</strong></td>
</tr>
</tbody>
</table>

As at the 30 June 2013 there were a total of 1052 SSDs registered with the EPA.

**Registration of premises where radioactive substances are kept or used**

Section 8 of the Act requires that premises on which a radioactive substance that is not contained in an SSD is kept or used must be registered with the EPA. The registration period for premises where radioactive substances are kept or used is 2 years.

At the end of the reporting period, the EPA registered 32 new premises (Table 9). Table 9 also summarises the numbers and categories of new premises registered with the EPA between 2008–09 and 2012–13.
TABLE 9
Numbers and categories of new premises registered where radioactive substances were kept or used between 2008–09 and 2012–13

<table>
<thead>
<tr>
<th>Premises category*</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>33</td>
</tr>
<tr>
<td>Medium</td>
<td>8</td>
</tr>
<tr>
<td>High</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
</tr>
</tbody>
</table>

* Premises are classified according to Australian Standard AS 2243.4 1998: Safety in Laboratories Part 4 – Ionizing Radiations). The categories of low, medium and high are based on the radionuclide hazard group and the levels of activity being used.

At the end of the reporting period there were 265 premises registered with the EPA where radioactive substances are kept or used.

Where a sealed radioactive source not contained in a SSD is kept or used on a premises, the occupier of the premises must provide the EPA with details of each sealed radioactive source that exceeds the ‘threshold activities for sealed radioactive sources’, as prescribed by the EPA. There is a greater potential for harm to people or the environment from these sealed radioactive sources if there is an accident or if they are misused, disposed improperly or lost.

Registration ensures that the occupier:

- complies with standards that help minimise the exposure to persons and the environment to harmful ionising radiation from a radioactive source that is kept or used on the premises
- maintains an inventory of the radioactive sources kept or used on the premises and the purpose for which they are used
- develops and maintains a security management plan.

Table 10 summarises the total numbers of active licenses and registrations as at 30 June 2013.
TABLE 10

Summary of total number of active licences and registrations as at 30 June 2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licence* to use, sell and/or possess radioactive substance and radiation apparatus</td>
<td>13,494</td>
</tr>
<tr>
<td>Registration of diagnostic imaging apparatus</td>
<td>8251</td>
</tr>
<tr>
<td>Registration of cyclotrons</td>
<td>2</td>
</tr>
<tr>
<td>Registration of therapy apparatus</td>
<td>88</td>
</tr>
<tr>
<td>Registration of sealed source devices</td>
<td>1052</td>
</tr>
<tr>
<td>Registration of premises where radioactive substances are kept or used</td>
<td>265</td>
</tr>
</tbody>
</table>

* Licensing requires that any person who uses a radioactive substance on a premises must have a licence to use that radioactive substance under the Act, unless they are an exempt person under the Regulation. A person who intends to sell or give away a radioactive source (individual or corporate) from a premises must be licensed to do so.

Accreditation of CREs

The Act provides for the accreditation of CREs, and through Section 9A of the Act the EPA may seek the Council’s advice on accreditation matters. The Regulation sets out the activities of a CRE, which include:

(a) advising on the design of premises to be registered under section 8 of the Act in relation to radiation safety requirements,

(b) assessing plans for premises to be registered under section 8 of the Act in relation to radiation safety requirements for the purpose of certifying compliance with the requirements necessary for registration,

(c) measuring and assessing radiation doses from ionising radiation apparatus used for medical therapy,

(d) measuring and assessing radiation doses from ionising radiation apparatus used for diagnostic purposes,

(e) advising on the design of premises, in relation to radiation safety requirements, in which sealed source devices or radiation apparatus prescribed under section 7 (1) of the Act are kept or used,

(f) assessing plans for premises in which sealed source devices or radiation apparatus prescribed under section 7 (1) of the Act are kept or used, for the purpose of certifying compliance with any requirements for registration under section 7 (5) of the Act,

(g) assessing radiation apparatus, sealed source devices and premises that are required to be registered under section 7 or 8 of the Act for the purpose of certifying compliance with the requirements for registration,

(h) assessing the integrity of any shielding of premises in which sealed source devices or radiation apparatus prescribed under section 7 (1) of the Act are kept or used for purposes of certifying compliance with the requirements for registration.
During the reporting period ending 30 June 2013, the Council considered the following accreditation applications:

- CRE for SSDs – fixed radiation gauges. The Council recommended that the applicant be granted the accreditation subject to successfully completing the examination and practical testing.

- CRE for diagnostic radiography, dental, fluoroscopy, computed tomography, bone mineral density, and chiropractic and veterinary apparatus. The Council recommended that the applicant be granted accreditation subject to their undertaking an assessment to the satisfaction of a person nominated by the Council.

- CRE for SSDs – fixed radiation gauges (application received from the EPA for an EPA officer). The Council recommended that the EPA officer undergo a competency assessment and if successful be granted accreditation in fixed radiation gauge assessment.

During the reporting period ending 30 June 2013 the EPA issued two new CRE accreditations. The number of new accreditations is the number of actual individual applications resulting in new accreditations being issued.

Table 11 lists the number of accreditation authorisations (conditions) issued for each category, which includes new applications and variations to existing accreditations. These figures represent the number of accreditation conditions issued, not the actual number of accredited CREs. A CRE may have more than one condition; therefore, the total number of accreditation conditions issued will be greater than the number of accredited CREs.

Table 11 shows that at the end of the reporting period there were 165 active accreditation conditions. A total number of 99 CREs are accredited by the EPA to perform one or more of the prescribed activities listed above. Only an EPA-accredited CRE may assess apparatus and issue a certificate of compliance verifying that the apparatus complies with the mandatory requirements for registration.
TABLE 11
Number of accreditation conditions issued during 2012–13 and the total number of accreditation conditions as at 30 June 2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Equipment</th>
<th>2012–13</th>
<th>Total as at June 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic imaging</td>
<td>Mammography</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Dental (intra-oral, OPG and cephalometry)</td>
<td>2</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Dental (intra-oral, OPG and cephalometry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radiography</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluoroscopy</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Computed tomography</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bone mineral densitometry (including veterinary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and chiropractic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radiography</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluoroscopy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computed tomography</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bone mineral densitometry (including veterinary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and chiropractic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td>Fixed radiation gauges</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
<td>165</td>
</tr>
</tbody>
</table>

OPG, orthopantomogram

CREs are required to renew their accreditation annually.

**Radiation accidents**

Clauses 27 and 28 of the Regulation outline the mandatory requirements imposed on an employer for reporting and recording radiation accidents. Clause 26 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 on the request of the EPA.

The causes of accidents are normally either a deficiency in the relevant management system or failure on the part of an individual 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 undertaken by the organisation) recommend counselling or further training to prevent this type of incident from recurring.

The Council may also recommend referral of serious health-related accidents to the Health Care Complaints Commission (HCCC). The EPA has standing advice from the Council to refer all matters considered significant by the Council to the HCCC.
Each year the Council emphasises that it is vital that accidents are consistently reported, even if the dose received has been negligible, not just because of a legal requirement, but 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.

In February 2013, Dr George Larcos, a previous member of the Council who is a Clinical Associate Professor at Sydney Medical School and Senior Staff Specialist at Westmead Hospital, provided Council members with his findings on the frequency of nuclear medicine maladministrations in NSW. Council members discussed at length Dr Larcos’s findings, particularly data suggesting a deficiency in the reporting of radiation accidents or incidents. The Council has included in its Strategic Direction 2013–2016 document a future project that would consider how to improve the level of reporting of radiation accidents.

During the reporting period ending 30 June 2013, the EPA was informed of 28 instances in which radiation accidents may have occurred, involving 38 people. The Council considered each case and, where appropriate, made recommendations that, in its opinion, would reduce the risk of a recurrence.

A summary of all the accidents reported to the Council and subsequent recommendations of the Council are provided below. The summary is grouped by categories of accidents, namely nuclear medicine, therapy and radiology and other.

**Nuclear medicine**

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

- A patient was given radiopharmaceuticals otherwise than as prescribed by being injected with 345 MBq (megabecquerel) Tc-99m MDP instead of 345 MBq Tc-99m sestamibi. The error occurred because of incorrect labelling during dispensing. The patient received an estimated effective dose of 2 mSv (milliSievert).

- Two patients were given radiopharmaceuticals otherwise than as prescribed owing to incorrect labelling during dispensing. The first patient was incorrectly injected with 227 MBq of Tc-99m DisHIDA (a hepatobiliary imaging agent) instead of DTPA (renal agent). This patient received an unnecessary effective dose estimated to be 6.7 mSv. The second patient was given 225 MBq Tc-99m DisHIDA instead of DTPA. This patient received an unnecessary effective dose estimated to be 3.8 mSv.

- A patient undergoing a PET/CT scan with 200 MBq F18-deoxyglucose had to have a repeat examination, as the syringe containing the radiopharmaceutical being injected into the cannula was not properly inserted. The patient received an estimated effective dose of 3.1 mSv.

- A patient was given Tc-99m HDP (a bone imaging agent) instead of Tc-99m sestamibi (a myocardial perfusion agent) because the vial had been incorrectly labelled by the dispensing supplier. The patient received an estimated effective dose of 3.1 mSv.

- A patient was incorrectly given a smaller dose of Kinevac (CCK) than required for a gallbladder test; this yielded a non-diagnostic image. The error occurred as a result of misinterpretation of the quantity written on the vial; thus a smaller dose was drawn. The patient received an estimated effective dose of 3.2 mSv.
• A patient scheduled for a myocardial perfusion stress test was injected with the incorrect radioactive tracer. The error occurred because established protocols were not followed by the licencee. The patient received an estimated effective dose of 7.32 mSv.

• A patient scheduled for a bone scan had to undergo a repeat scan because the radiopharmaceutical was injected into the patient’s subcutaneous line instead of the intravenous line. The error occurred as a result of human error. The patient received an unnecessary estimated effective dose of 1.7 mSv.

• A patient was required to undergo a repeat study using Tc-99m sestamibi for a stress examination. During the initial injection a spill had occurred because of a loose connection. The connection was tightened and the remainder of the substance was injected. The patient received an unnecessary estimated effective dose of 2.5 mSv.

• A patient was incorrectly injected with 650 MBq of Tc-99m because of patient misidentification. The error occurred because the request was attached to the wrong electronic patient record. The patient received an estimated effective dose of 6.3 mSv.

• A patient was given what was thought to be 1060 MBq Tc-99m HMPAO. Imaging revealed no cerebral uptake and demonstrated bio-distribution of Tc-99m pertechnetate. Preliminary investigations suggested a cold kit failure. Further investigations are being made by the supplier. The patient received an estimated effective dose of 13.8 mSv.

• A patient was incorrectly given Tc-99 HDP instead of Tc-99m sestamibi. The error occurred as a result of mislabelling of the radiopharmaceutical by the supplier because the radiochemist failed to follow protocols. The patient received an estimated effective dose of 5.1 mSv.

The Council reviewed the following accidents and recommended the following actions:

• A patient was injected with Tc-99m sestamibi instead of Tc-99m HDP. The error occurred because of incorrect labelling of the radiopharmaceutical by the supplier. The Council recommended that training and shift-duration issues needed to be considered and suggested that the EPA consider the following matters:
  − Ascertain what training was received and whether the training provided by the facility was adequate.
  − Compare this accident with other similar facilities.
  − Ascertain whether the length of shift being worked by the radio-chemists had contributed to the radiation accident.

As at 30 June 2013, the EPA was investigating the matter.

• Eleven patients were injected with Tc-99m sestamibi, a cardiac imaging agent, but the scan did not produce a diagnostic image. The error occurred because of incorrect dispensing of the radiopharmaceutical by the supplier and failure of quality control testing (i.e. the product had failed the minimum tagging efficiency of 90%). Affected patients received an estimated effective dose of between 4.25 mSv and 13 mSv.

The Council noted that the supplier had previously been issued with notices under the Regulation requiring GMS to appoint an RSO and to develop an RSM for the EPA to consider. The Council asked the EPA to investigate the matter further and if necessary to consider suspending or cancelling radiation user licences. As at 30 June 2013, the EPA was investigating the matter.
Therapy

During the reporting period the Council reviewed the following accident and the controls that the facilities had instigated to correct deficiencies in their standard operating procedures, and was satisfied with the steps the organisations had taken to prevent the type of incident from recurring.

- During the preparation for a therapy administration a lead pot containing 8 GBq of Lu-177 in 100mls was dropped on a carpet outside the therapy area during transit. The vial cracked and released 10–20mls of radioactive saline solution onto the carpet where it spread to form a spot of approx 5cm x 5cm. Exposures of person to direct radiation was negligible.

The Council reviewed the following accident and recommended that the EPA require the employer to provide a Root Cause Analysis of the accident when it becomes available. Council also requested that the employer provide details of the actions taken by it to prevent recurrence of this type of accident from recurring. As at 30 June 2013, the Root Cause Analysis was still being undertaken.

- A patient undergoing a 2 phase treatment involving 42.4 Grays delivered in 16 fractions, followed by a two-field boost treatment of 10 Grays delivered in 4 fractions as treatment for breast cancer, received 1.25 Grays of the boost treatment to the wrong breast. The error occurred due to incorrect documentation. The patient received an estimated dose of 150 mSv.

Radiology

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

- The wrong patient received a CT scan as a result of the wrong patient’s name being selected when a request was completed in the electronic request system. The patient received an estimated effective dose of 6.5 mSv.

- A patient incorrectly received a CT scan of the brain owing to patient misidentification. The patient received an estimated effective dose of 2 mSv.

- A patient received a CT scan of the chest that was not required owing to a booking system error. The patient received an estimated effective dose of 9.5 mSv.

- A patient received a CT scan of the brain that was not required owing to patient misidentification. The patient received an estimated effective dose of 2.7 mSv.

- A patient incorrectly received a CT and chest X-ray because of patient misidentification. The patient received an estimated effective dose of 3.7 mSv.

- A patient received a CT scan of the shoulder in error because of patient misidentification. The patient received an estimated effective dose of 7.8 mSv.

- A patient received a repeat CT of the pelvis in error. The error occurred because the original request was faxed to the department twice. The patient received an estimated effective dose of 14 mSv.

- A patient received a repeat CT of the shoulder in error. The error occurred because the original request was faxed and then sent. The patient received an estimated effective dose of 7 mSv.
• A patient incorrectly received a CT of the abdomen and pelvis. The error occurred because of patient misidentification: the wrong wrist band was attached to the patient. The patient received an estimated effective dose of 12 mSv.

• A patient incorrectly received a CT of the abdomen because of patient misidentification. The error occurred because patient identification protocols were not followed. The patient received an estimated effective dose of 9.6 mSv.

• A patient received a CT brain scan instead of a CT pulmonary angiogram. The error occurred because the protocol for checking the requested procedure was not followed. The patient received an estimated effective dose of 2.4 mSv.

• A patient received a repeat CT scan component of a PET/CT scan because of CT equipment failure. The patient received an estimated effective dose of 1.8 mSv.

Other

• The EPA provided the Council with an overview of an incident in which a load of scrap metal shipped to Thailand from Australia was returned because radiation was detected in the scrap metal. The load was shipped back to Australia, where the container was opened and the source of radiation located and identified as cesium 137, which may have come from a soil moisture density gauge. The EPA is investigating the matter to identify the owner of the source and determine how it came to be exported in the scrap metal.

Categories of radiation accidents reported between 2008 and 2013

Table 12 summarises the accidents reported to the EPA in specific categories between 2008–09 and 2012–13.

<table>
<thead>
<tr>
<th>Accident category</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear medicine</td>
<td>14</td>
</tr>
<tr>
<td>Therapy</td>
<td>5</td>
</tr>
<tr>
<td>Radiology</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
</tr>
</tbody>
</table>
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.

The EPA is part of the Office of Environment and Heritage (OEH) and remains a statutory body with specific powers under environment protection legislation. Staff of OEH exercise regulatory activities for, and on behalf of, the EPA. Staff of OEH also provide administrative support to the Radiation Advisory Council on behalf of the EPA.

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 annually and remain in force until such time as both parties agree otherwise.

The roles and responsibilities for each body are set out in the Radiation Control Act 1990 (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, registrations 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 to be 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 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, registrations 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, registration and accreditation
The EPA is the determining authority for applications for licences, registrations and accreditations and for variations to licences and accreditations, as made under Part 2 of the Radiation Control Act 1990. The EPA is empowered by section 9A 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. 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 2003, and the standing advice of the Council.
Unless the Chief Executive 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 Chief Executive 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.

LISA CORBYN
Chief Executive
Office of Environment and Heritage

CRAIG LAMBERTON
Chairperson
Radiation Advisory Council

The MoU was signed by both parties on 25 March 2010.

Note: The MoU was reviewed by the RAC at its June 2013 meeting.
Appendix 2: Membership of committees of the Council during 2012–13

<table>
<thead>
<tr>
<th>National Directory Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Member</strong></td>
</tr>
<tr>
<td>Dr Richard Smart</td>
</tr>
<tr>
<td>Mr Jon D’Astoli</td>
</tr>
<tr>
<td>Dr Philip Pasfield</td>
</tr>
<tr>
<td>Dr Mary Dwyer</td>
</tr>
<tr>
<td>Mr Lee Collins</td>
</tr>
<tr>
<td>Mr Frank Galea</td>
</tr>
<tr>
<td>Mr Len Potapof</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Review of Guideline 6 Committee</th>
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</thead>
<tbody>
<tr>
<td><strong>Member</strong></td>
</tr>
<tr>
<td>Mr Lee Collins</td>
</tr>
<tr>
<td>Dr Philip Pasfield</td>
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<tr>
<td>Mr Glen Burt</td>
</tr>
<tr>
<td>Dr Richard Smart</td>
</tr>
<tr>
<td>Mr Paul Cardew</td>
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<tr>
<td>Dr Jennifer Diffey</td>
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<tr>
<td>Mr Peter Williams</td>
</tr>
</tbody>
</table>
## Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSTO</td>
<td>Australian Nuclear Science and Technology Organisation</td>
</tr>
<tr>
<td>ARPANSA</td>
<td>Australian Radiation Protection and Nuclear Safety Agency</td>
</tr>
<tr>
<td>CPD</td>
<td>continuing professional development</td>
</tr>
<tr>
<td>CRE</td>
<td>consulting radiation expert</td>
</tr>
<tr>
<td>CT</td>
<td>computed tomography</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>HCCC</td>
<td>Health Care Complaints Commission</td>
</tr>
<tr>
<td>MBq</td>
<td>megabecquerel</td>
</tr>
<tr>
<td>MoU</td>
<td>memorandum of understanding</td>
</tr>
<tr>
<td>mSv</td>
<td>milliSievert</td>
</tr>
<tr>
<td>OPG</td>
<td>orthopantomogram</td>
</tr>
<tr>
<td>PET</td>
<td>positron emission tomography</td>
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<tr>
<td>RHC</td>
<td>Radiation Health Committee (National)</td>
</tr>
<tr>
<td>RSM</td>
<td>radiation safety manual</td>
</tr>
<tr>
<td>RSO</td>
<td>radiation safety officer</td>
</tr>
<tr>
<td>SSD</td>
<td>sealed source device</td>
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</table>