



**REPORT OF THE**

**RADIOLOGICAL COUNCIL**

**OF WESTERN AUSTRALIA**

**for the year ended**

**31 December 2001**



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## CHAIRMAN'S REVIEW



Western Australia promulgated the country's first radiation safety legislation in 1954. Since that time, the Radiological Council, established under the *Radiation Safety Act*, has been well regarded by other jurisdictions as a leader in public health and occupational radiation safety procedures.

The Council is rightly proud of this achievement and works resolutely to maintain its high standards particularly as its prime responsibility is to provide the Minister with consistent, reliable and practical advice on radiation health and safety matters.

The *Radiation Safety Act* requires the Minister to have regard to the expressed views of the Council. Although the Minister is not necessarily bound by that advice, the breadth of experience of Council members is such that it is unlikely that better radiation safety expertise would be available to him elsewhere in the State.

In its published standards, the International Atomic Energy Agency recommends that radiation regulatory authorities be independent of government departments and agencies that are themselves responsible for the promotion and development of the practices being regulated. In this regard, it is crucial that Council's deliberations and its advice to the Minister continue to be, and perhaps more importantly be seen by the public to be, independent of government departments, including the Department of Health and the Department of Mineral and Petroleum Resources which are substantial users of radiation and, therefore, subject to regulation.

This independence was considered an important factor by both the Government and the Opposition when the *Nuclear Waste Storage (Prohibition) Bill* was debated in Parliament in 1999. This independence must not be diminished.

The year saw the retirement of Mr Barry Cobb, Secretary of the Council since February 1999, and Dr George Koperski, a Council member since 1997. Mr Cobb has worked at the Radiation Health Section for over 30 years and has made a significant contribution to the workings of the Council in that time, especially in his position of Secretary. His experience and support in his role of Secretary will be missed by both the Council and the staff of the Radiation Health Section. Dr Koperski has made a worthy contribution to the Council in the field of radiation in mining in Western Australia.

The year 2001 saw a diverse range of issues requiring Council attention. These are described fully in the body of the Report. TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) has again generated interest and was the subject of a number of investigations. In the medical field, an important decision made by Council was to restrict x-ray operators to providing services outside the metropolitan area only. X-ray operators, who have Council approved but limited training in basic radiography of the chest and extremities, provide an important service in many country areas where the provision of major x-ray facilities and qualified radiographers is not viable.

Finally, I would like to express my appreciation to all the members of Council who have tirelessly given of their expertise, and to the staff of the Radiation Health Section who provide administrative and scientific support to the Council. The latter have diligently upheld the radiation safety standards in the State throughout the year.

A handwritten signature in black ink, reading 'P Psaila-Savona' in a cursive style.

**Dr P Psaila-Savona**  
**CHAIRMAN**

1 February 2002

## **RADIATION SAFETY ACT 1975 – 1999**

### **STATUTORY RESPONSIBILITIES OF THE COUNCIL**

The Radiological Council is appointed under section 13 of the Radiation Safety Act to assist the Minister to protect public health and to maintain safe practices in the use of radiation.

In its position as an independent regulatory authority, the Council is required to administer the Act and to —

- implement the scheme of licensing and registration;
- conduct inquiries into alleged contraventions of the Act and, where necessary, to suspend or cancel licences and registrations;
- advise the Minister and make recommendations with respect to the technical aspects of radiation safety requirements, the methods that may be used to prevent or minimise the dangers arising from the use of radioactive substances, irradiating apparatus and electronic products, including the preparation of regulations;
- investigate and prosecute offences.

The Council is also required to keep under review manufactured or assembled devices which emit radiation to determine if control of these devices is necessary under the Act.

Section 10 requires the Minister at all times to have regard to the expressed views of the Council.

### **MEMBERSHIP OF THE COUNCIL**

The Council comprises —

- a medical practitioner appointed by the Governor on the recommendation of the Executive Director Public Health;
- a medical practitioner who is a specialist in radiology or radiotherapy;
- a physician specialising in nuclear medicine;
- a person who possesses relevant qualifications or experience as a physicist;

- a person who possesses relevant qualifications or experience as a radiation engineer or electronic engineer;
- a representative of the interests of tertiary educational institutions.

Two other persons with special expertise in radiation protection may be nominated by the Minister on the advice of the other members of the Council.

The present members, approved by the Governor, are listed in Attachment 1.

The Council met six times in 2001.

### **ADVISORY COMMITTEES**

The Council may appoint committees under section 19 of the Act to investigate and advise on any aspect of its functions, or to carry out any function other than those relating to licences and registrations. The present policy is to create, when necessary, short-term working parties which address a specific issue and report back to the Council.

The only exception is Council's Chiropractic Advisory Committee which is appointed to supervise the radiation safety examination for chiropractors who wish to apply for licences to operate diagnostic x-ray equipment. The committee, which also advises Council on other chiropractic matters, met once in 2001.

### **ADMINISTRATIVE SUPPORT**

Section 10(4) of the Act provides for the administration of the Act to be paid out of moneys appropriated by Parliament for the purpose. However, the Council is not funded directly and relies on the Department of Health's Radiation Health Section for administrative and scientific support. While the greater part of the Section's duties are directly concerned with supporting the Council's needs, and many of the staff are appointed authorised officers under section 4(1) of the Act for this purpose, the Section also provides separate advice to the Department on a range of radiation issues.

The Radiation Health Section also provides the Secretary of the Council. This position had been held by Mr B J Cobb (Senior Scientific Officer) until his retirement from the Health Department on 21 December 2001, henceforth being held by Dr L F Toussaint (A/Managing Physicist) with Mrs M Aerts (Physicist) performing these duties in Dr Toussaint's absence.

## **REGISTRATIONS, LICENCES AND TEMPORARY PERMITS**

Registration and licensing are the principal means by which the use of radiation is regulated.

### ***Registrations***

Section 28 of the Act requires prescribed radioactive substances, x-ray equipment and electronic products, together with the associated premises, to be registered. Registrants may include individuals, companies, organisations or institutions.

All x-ray equipment is prescribed while prescribed electronic products include lasers, transilluminators and microwave ovens.

Radioactive substances that exceed the exempt quantities prescribed in the regulations are subject to registration. A small number of devices containing radioactive substances in excess of the exempt limits, but which pose a minimal hazard to users, have been exempted by regulation from control under the Act.

### ***Licences***

Section 25 of the Act requires persons who manufacture, store, transport, sell, possess, install, service, maintain, repair, use, operate or otherwise deal with prescribed radioactive substances, x-ray equipment or electronic products to be licensed or, where permitted, work under the direction and supervision of a licensee.

### ***Exemptions from Licence***

A licence is not required where a general exemption is provided by the regulations or where a person has been granted an individual exemption from licence. Although exempt from licensing, the regulations nevertheless specify the minimum qualifications or training required for these radiation workers.

### ***Temporary Permits***

The shortest period for which a licence or registration can be granted is 12 months. However, for shorter periods an application may be made for a Temporary Permit. Permits cannot exceed a duration of 3 months.

### ***Conditions, Restrictions and Limitations***

A range of performance and safety requirements for radioactive substances, x-ray equipment and the prescribed electronic products are specified in the

regulations. However, additional safety measures may be applied by the Council under section 36 of the Act through conditions, restrictions and limitations applied to registrations, licences, temporary permits and exemptions.

Failure to comply with a condition is an offence.

Attachment 2 shows the types and numbers of licences and registrations (or individual exemptions) granted or renewed in 2001.

### ***Commonwealth Government Agencies and Contractors***

The Radiation Safety Act does not apply to Commonwealth agencies or to their employees (or contractors) who might use radiation in Western Australia. Those agencies are regulated by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) under the Commonwealth Government's Australian Radiation Protection and Nuclear Safety Act 1999.

## **QUALIFICATIONS AND TRAINING OF RADIATION USERS**

### ***Licence Prerequisites***

Before a licence may be granted, the Council has an obligation to ensure that an applicant has appropriate qualifications, competence and experience (section 33).

Protocols have been developed which prescribe the prerequisite qualifications and experience necessary for a wide range of radiation uses. Some qualifications are recognised by the Council because an appropriate degree of radiation safety training is inherent in gaining those qualifications. However, other applicants may be required to attend a recognised radiation safety course and pass an examination. The Council has authority to impose examinations under the Radiation Safety (Qualifications) Regulations.

Persons who are not required to hold a licence themselves but who must work under the direction and supervision of a licensee may also be required to hold certain qualifications or to have undergone additional radiation safety training. These requirements may be imposed by regulation or through conditions, restrictions and limitations imposed under section 36. The registrant for the premises where the individual works is primarily responsible for ensuring compliance with these criteria.

Courses in various aspects of radiation safety are offered by both the government and private sectors, for example:

*X-ray Operator  
Compliance Testing of Diagnostic X-ray Equipment  
Fluoroscopy – Medical  
Industrial Radiography  
Fixed Radioactive Gauges  
Portable Radioactive Gauges  
Well (Borehole) Logging  
Transport of Radioactive Substances  
Lasers – Medical and Industrial*

## **CHANGES TO LEGISLATION**

Amendments to the regulations made in 2001 are listed in Attachment 3.

## **NUCLEAR WASTE STORAGE (PROHIBITION) ACT**

In 1999, the Government passed the Nuclear Waste Storage (Prohibition) Act which imposes restrictions on the disposal of “nuclear waste” (as defined in that Act). A concurrent amendment to the Radiation Safety Act (section 41A) requires the Council to refer any authorisation for the disposal of “nuclear waste” to Parliament for consideration. The agreement of both houses of Parliament is required before the authorisation may be granted.

No applications were made in 2001 for the disposal of radioactive waste that would have required the Council to report the matter to Parliament. The Council is however at present considering a situation where waste is being generated just outside WA territorial waters which may therefore invoke the Nuclear Waste Storage (Prohibition) Act.

## **RADIATION INCIDENTS**

Reported incidents involving radiation are infrequent and rarely pose a major health risk to the individuals exposed. Regulation 19A of the Radiation Safety (General) Regulations requires registrants to notify the Council in writing and as soon as practicable should any of the abnormal or unplanned radiation exposures specified in that regulation occur.

Although there is no certainty that all incidents are reported, Council encourages thorough reporting and investigation since this provides a forum for improving work practices so that such incidents are not repeated.

The Council was notified of the following nine incidents during 2001:

- An individual reported light-headedness and sensations around his teeth after allegedly working in close proximity to a marine radar antenna with an output of 25 kW at a frequency of 10 GHz. It remained unclear, after investigation, how the person had apparently bypassed the security features in the building to gain access to the operating radar antenna. After failed attempts to contact the individual for further information, the matter was not pursued by the Council.
- A mining company reported that contractors had worked on the removal of two density gauges which had not been isolated before work commenced. The contractors removed the detector of one density gauge and had commenced the removal on the second before halting work.

The estimated radiation dose was 115  $\mu\text{Sv}$  for the 5 minute exposure. The main cause of the incident appeared to be failure of the employees to follow safe working rules. The company took action to improve communication on safe practices.

- A mining and mineral processing company reported that three contractors entered a vessel in which only two of the three  $^{60}\text{Co}$  level gauges were isolated. The highest estimated dose to any of the contractors was 230  $\mu\text{Sv}$ .

The cause of the incident was a failure to follow written safety procedures and insufficient practical experience. Council officers gave instructions to the company concerning the apparent lack of training and the need for amendment of their written working rules.

- A medical practice reported the loss of a 3.8 MBq  $^{57}\text{Co}$  point source used for quality control. It is thought that the source was removed by cleaners after it had been placed on the floor overnight by service personnel from a medical service company in order to test a piece of equipment.

The medical practice wrote to the service company reminding them of the procedures that must be followed when sources are provided for test purposes. Source manufacturers were contacted to suggest the use of bright colours so that these small sources are less likely to be overlooked.

- A company using moisture density gauges reported the theft of a gauge from its allegedly locked transport container bolted to the back of a vehicle. From the advice given, it appeared that the gauge was appropriately secured for transport.

The Council (concerned that the device might be found and tampered with) provided a media release to The West Australian newspaper, and there was

local publicity on television and radio and school visits by company representatives. The gauge was recovered intact some weeks later from a storm water drain not far from where it had been stolen.

- A hospital reported that a scrub nurse in the cardiac catheterisation unit recorded a dose of 36.7 mSv on one of the personal radiation monitoring devices allocated to her for a one-month monitoring period. However, her other dosimeter labelled “external” (worn on the collar outside the lead apron) recorded a dose of 0.07 mSv.

The Hospital’s report on the incident included a statement from the Senior Medical Imaging Technologist that, on one occasion during the period in question, the dosimeter recording the high dose had been found on the floor near the x-ray tube after an x-ray session. Other staff working at a closer proximity to the x-ray tube had not received noteworthy doses. Council decided that the nurse was unlikely to have received the dose and that the high record was possibly due to insufficient attention to personal monitoring requirements.

- A mining company reported an incident where an interlock on a sorting machine, which is used to ensure a radiation shield is in position before x-rays can be generated, had failed.

During the five minutes that the machine was on, one person may have received a dose of around 200  $\mu$ Sv while another three potentially received 95  $\mu$ Sv. The faulty switch has since been replaced by the company, additional shielding provided and a secondary backup interlock installed.

- A nuclear medicine practice reported the misadministration of a paediatric nuclear medicine diagnostic dose which involved initial injection with  $^{99m}\text{Tc}$  labelled onto the wrong radiopharmaceutical agent. The misadministration was the result of dispensing and labelling errors by the supplier who inadvertently supplied  $^{99m}\text{Tc}$  hepatate colloid (used for liver investigations) labelled as  $^{99m}\text{Tc}$  pentatate DTPA (which had been ordered for a kidney investigation). The error was identified only when imaging of the patient showed liver and spleen rather than kidney uptake.

The patient received a greater activity of  $^{99m}\text{Tc}$  than would normally be given to an 8 kg child for a liver scan (125 MBq administered compared to 70 MBq). This was in addition to the subsequent correct administration of the prescribed 150 MBq  $^{99m}\text{Tc}$  DTPA for the kidney investigation. The radiopharmaceutical supplier immediately reviewed procedures and has initiated an Australia-wide colour coding system for pentatate versus hepatate agents to minimise the chances of such an error recurring.

- An industrial radiography company reported that one of their employees allegedly received a beta radiation dose of 35.5 mSv and a gamma dose of 7.56 mSv over a one-month monitoring period. The cause of the beta dose is unknown and is being investigated as it is unlikely that industrial radiographers would be exposed to such beta doses during their normal course of work.

Although the employee could not identify any work practices that could account for the gamma dose, any failure by the operator to manually close the shutter on the industrial radiography container might have resulted in exposure to a small solid angle radiation beam that would otherwise be emitted from the front of the container. Therefore the gamma dose remains as part of the employee's dose record.

## PROSECUTIONS

No prosecutions were finalised in 2001.

## MEDICAL AND RELATED RADIATION MATTERS

### *Radiation Doses and Digital Imaging*

Digital image receptors have become more prominent in the last few years, increasingly replacing film and cassette combinations. Since the digital receptor requires less input than conventional film, reduced radiation exposure might be expected. However images which would ordinarily have been construed as too dark on film can be adjusted on computer to a diagnostic standard so that personnel operating the x-ray equipment may be less diligent about using the optimal exposure factors. This can lead to exposures above those required for good diagnostic images.

Council noted one such case in 2001 where a dentist was asked to instigate remedial action to reduce what appeared to be unnecessarily high radiation doses linked to the use of a digital intra-oral image receptor. The higher doses had been reported as a result of measurements of the compliance testing program for medical, dental and chiropractic x-ray equipment.

### *Use of Fluoroscopy by General Practitioners*

A Member of the Legislative Assembly requested that regulations be amended to allow general medical practitioners in country areas to use x-ray fluoroscopic equipment. Since patient doses from fluoroscopy can be significant, fluoroscopy is restricted to appropriately qualified persons. The

Regulations currently permit use by radiologists, radiation oncologists, or other medical specialists, who hold a licence for the purpose, or by non-radiologist specialists who hold individual exemptions from licence, and by radiographers in specific conditions.

The Council formed the view that there are reasonable grounds for allowing non-specialist practitioners in remote areas access to fluoroscopic x-ray equipment for fracture reductions. Individual exemptions from non-specialist practitioners in these areas will be considered where there is no alternative service provided by a licensed/exempted specialist, and the applicants will be required to complete the approved fluoroscopy radiation safety course. Each exemption will be restricted to fracture reductions in remote areas. The intention is also that the authority would be removed should a specialist service become available. These approvals will be restricted to specific country locations only.

### ***Compliance Testing of Diagnostic X-Ray Equipment – Dating of Certificates***

The diagnostic compliance testing program involves a range of test frequencies for different types of equipment. The procedure for testing involves having the x-ray unit tested by a licensed compliance tester and the test results checked and the unit certified by a Qualified Expert. A notice of Non-Compliance is issued for faulty equipment setting a time for correction of the fault (usually 3 months) during which the equipment may generally continue in use. The specified date for the next compliance test on a given machine has been the prescribed test frequency period added to the date the Qualified Expert has issued the certificate.

It is not unusual for long delays to occur between testing and the submission of test data for certificate issue, particularly where repairs are required. To prevent drift effect between test periods, the Council has adopted an expiry date for compliance certificates dating the specified test frequency from the test date, regardless of when the Qualified Expert signs the certificate.

### ***Intra-operative X-ray Therapy Device***

A portable intra-operative therapeutic x-ray machine (operating at a maximum of 50 kV) was registered for use in delivering localised radiotherapy during certain surgical procedures.

High, accurately determined therapeutic doses are intentionally delivered to localised areas of the patient, and there is the potential for high doses to staff if not used by specifically trained persons with the appropriate safeguards. A licensed radiation oncologist, or other medical practitioners working under the

direct and immediate personal supervision of the licensed radiation oncologist, must operate the unit. A radiotherapy physicist is required to be present to calibrate the device immediately prior to treatment and to supervise radiation protection measures.

### ***Dental Ancillary Training Courses***

The conditions of registration for dental radiography allow dental ancillary staff to operate dental x-ray equipment under the direction and supervision of a dentist. Until 2001, the qualifications of ancillary personnel were not defined and the depth of their specific training in radiation safety not known.

On the suggestion by the Australian Dental Association (WA Branch), the Regulations were amended for the Council to prescribe “approved” qualifications for dental ancillary workers. The Australian Dental Association reviewed current dental ancillary training programs provided by Curtin University, TAFE and Dental Nursing Australia and found them satisfactory to be prescribed as “approved” for the purposes of the Radiation Safety (General) Regulations.

### ***X-ray Operators in the Metropolitan Area***

Nurses in Western Australia have often been called upon to take radiographs where radiographers have not been available, especially in remote country areas. In 1972 this was formalised with the introduction of the x-ray operator course. Guidelines were established to allow nurses to take radiographs of the chest and extremities using low-powered x-ray equipment, after they had completed the course and passed the assessment.

X-ray operators are still an integral part of diagnostic radiography in the smaller country hospitals of Western Australia. However, the need for x-ray operators in the metropolitan area has been questioned as there are numerous public and private hospitals and radiology practices.

Taking into account a survey of operator practices in the metropolitan area, the number of films taken at the practice and the distance to the closest hospitals and radiology practices, Council decided that x-ray operators would be restricted to providing services outside the metropolitan area only.

### ***Administration of Radioisotope Therapy***

Radioisotope therapies using various nuclides are now administered in a number of hospitals. A physicist is required to be present, and to be available for relevant radiation safety follow-up particularly during in-patient treatment.

A survey of staff radiation doses, including doses to fingers, undertaken during an unsealed radioisotope therapy procedure ( $^{90}\text{Y}$  microsphere treatment of liver cancer) in a private hospital had shown some large doses. Investigations indicated that the large doses were almost certainly due to an inadvertent placement of the dosimeters concerned near the dose stock solution, since none of the concurrently worn regulation personal dosimeters had shown similar results.

Nevertheless, a Council officer attended subsequent administrations of the therapy at the hospital. During one procedure, there was a small spill of radioactive material on the floor with contamination of protective clothing and footwear. Although there was no significant staff exposure, a comprehensive report was presented to Council on the actions taken and advice given by the Council officer to improve contamination surveillance and procedures in the event of spills. The Hospital undertook to follow the advice.

## **INDUSTRIAL, ENVIRONMENTAL and MINING RADIATION**

### ***NORM and TENORM***

The last three Annual Reports drew attention to the potential build-up of radioactive material from the presence of naturally occurring radioactive material (NORM) and technologically enhanced naturally occurring radioactive material (TENORM). Mineral industries are a potential source of NORM and the subsequent processing of mineral products may give rise to TENORM.

During 2001, Council was advised of the following TENORM investigation:

- In January, a scrap metal company reported the detection of radioactive scrap metal on their premises. The scrap piping was lined with TENORM which was identified as  $^{226}\text{Ra}$  (radium) by Council officers. The radiation levels exceeded the Exempt Quantities of Schedule V of the Regulations, meaning that the TENORM fell within the definition of “radioactive”.

While this meant that there was a requirement to register the scrap metal under the Act, there was concern that the cost of registration might dissuade persons from advising the Council that they possessed such material. The Council decided that individual exemptions from registrations (which do not attract a fee) would be granted in such cases.

### ***Flyash***

Flyash is a waste product from coal burning power generation which contains

slightly elevated levels of NORM. In 2001, two requests were put to the Council to approve the use of flyash:

- A brick production company applied for approval to incorporate flyash into their brick products. Samples of proposed brick products demonstrated that a maximum of 20% concentration of flyash would not pose a significant radiological risk to the public. Council therefore approved the use.
- A turf company asked for and obtained approval to incorporate up to 100 m<sup>3</sup> of flyash into a school and community oval to assist with water retention. Analysis of a sample showed that the dose-rate from the flyash was of minimal radiological concern.

### ***Montebello Islands***

The Montebello Islands off the north-west coast of Western Australia were used for British nuclear testing in 1952 and 1956. The Radiation Health Section attempts to survey the Islands at approximately 2-year intervals to ensure public health measures remain appropriate.

A survey was carried out in June 2001 with the aim of checking radiation levels and ensuring that appropriate public warning signs were present. The conclusion of the survey was that the Montebello Islands are not considered a radiation health hazard to the occasional visitor to the Islands or to native wildlife present on the Islands. However, it was recommended that time spent by the casual visitor around the two Ground Zeros and on Main Beach on Trimouille Island, be limited so that the annual dose (above normal background) is less than 1mSv.

### ***Other***

The Radiation Health Section has been involved in a number of surveys in relation to contaminated sites and has provided advice on the remedial action required. The investigations have uncovered limitations in the legislation which may require changes to incorporate provisions for managing contaminated sites.

## **MISCELLANEOUS**

### ***Self-Luminous Watches***

The Radiation Safety (General) Regulations outline what is and is not considered radioactive with regards to self-luminous devices. In April 2001, Council officers inspected over 1000 wrist-watches comprising 29 different

brands in Perth retail and wholesale outlets. The outcome showed that none of the inspected watches had readings above background.

In December a request was made for Council to allow the sale of wrist-watches containing 925 MBq  $^3\text{H}$  (tritium) in numerous borosilicate glass elements (Gaseous Tritiated Luminous Devices (GTLDs)), the amount of  $^3\text{H}$  being higher than the Exempt Quantity specified in the Regulations. While Council noted that all uses of ionising radiation should be justified and, in principle, watches could be satisfactorily illuminated by non-radioactive means, it was accepted that the potential radiation dose from this amount of  $^3\text{H}$  was trivial. The Regulations are in the process of being amended to exempt up to 1 GBq  $^3\text{H}$  to bring Western Australia in line with the IAEA Basic Safety Standards, and national regulations of European and other countries.

### ***Minimum Age for Licensees***

The regulations specify a minimum age for a radiation worker of 16 years (adopted from the National Occupational Health and Safety Commission "*National Standard for Limiting Exposure to Ionizing Radiation*"). In 2001, the question of allowing minors to hold radiation licences was raised when a 17 year old sat the industrial radiography assistant's examination. This posed questions of the possible community concern should the Council grant a licence for the use of potentially dangerous quantities of radioactive material to a person who is legally a minor. The Council decided that, other than in exceptional circumstances, a person should be 18 years of age before being eligible for any licence under the Act.

### ***National Directory for Radiation Protection***

The Australian Health Ministers Council decided that the principles and guidelines adopted by the National Directory for Radiation Protection (now under development as part of a national uniformity requirement of the Commonwealth ARPANS Act) are to be implemented by all Australian jurisdictions. The Radiological Council has long been a supporter of uniform radiation safety practice, frequently giving the lead to other jurisdictions. However it would possibly recommend against the adoption of some practices if they were not considered appropriate for Western Australia. The Minister will be advised on these issues if and when they arise.

### ***Personal Radiation Monitoring Services***

Council has now recognised four organisations for the provision of a personal radiation monitoring service in accordance with the Regulations:

- ARPANSA (Australian Radiation Protection and Nuclear Safety Agency), the Commonwealth Government's radiation safety agency in Victoria

- New Zealand National Radiation Laboratory, the New Zealand national radiation safety organisation  
(Australian agent: Australia Radiation Services, Pty., Ltd., Victoria)
- Australia Radiation Services Pty Ltd, a company based in Victoria
- Landauer Inc., a US based company  
(Australian agent: Radiation-Wise, Perth, Western Australia)

## **STATE ELECTORAL ACT**

For the purposes of section 175ZE of the State Electoral Act, the Radiological Council has no expenditure to report. The Council's operations are fully supported by the Department of Health. It does not have a separate budget.

**Attachment 1****MEMBERS OF THE 9<sup>TH</sup> RADIOLOGICAL COUNCIL**

<b>Members</b>	<b>Qualification or Designation</b>	<b>Deputy</b>
<i>Appointment under Sections 13(2)(a) and 13(3) of the Act</i>		
Dr P Psaila-Savona (Chairman)	Medical Practitioner	Dr G Groom
<i>Appointment under Sections 13(2)(b) and 15(1) of the Act</i>		
Dr N Costa	Tertiary Institutions representative	Dr B Adler
Dr R Fox	Physicist	Dr R Price
Dr G Groom	Nuclear Medicine Physician	Dr M McCarthy
Mr N Hicks	Radiographer	
Mr J Hunter	Electronic Engineer	
Dr G Koperski	Expert in Mining Radiation Hazards	
Dr S Song	Radiologist	Dr A Kumar
Ms H Upton	Co-opted member – Mining Radiation	

**2001 MEETING ATTENDANCE**The 9<sup>th</sup> Council

	<b>10 Feb</b>	<b>13 Apr</b>	<b>14 Jun</b>	<b>23 Aug</b>	<b>11 Oct</b>	<b>13 Dec</b>
Dr P Psaila-Savona	✓	✓	✓	✓	✓	✓
Dr N Costa	A	A	✓	✓	✓	✓
Dr R Fox	✓	✓	✓	✓	✓	✓
Dr G Groom	A	✓	✓	✓	✓	✓
Mr N Hicks	✓	A	✓	✓	✓	✓
Mr J Hunter	✓	✓	✓	A	✓	✓
Dr G Koperski	✓	A	✓	A	A	R
Dr S Song	✓	✓	✓	D	✓	✓
Ms H Upton	NA	NA	NA	NA	✓	✓

✓ attended   A apology   D deputy   R Retired   NA not appointed at the time

**Attachment 2****LICENCES AND REGISTRATIONS***Current at 31 December 2001**Including individual exemptions granted under section 6 of the Act.*

	<b>X-ray and/or Electronic Products</b>		<b>Radioactive Substances</b>		<b>TOTAL</b>	
	<b>2001</b>	<b>2000</b>	<b>2001</b>	<b>2000</b>	<b>2001</b>	<b>2000</b>
<b>Licences</b>	1847	1728	959	960	2806	2688
<b>Registrations</b>	1235	1127	301	278	1536	1405
<b>TOTAL</b>	3082	2855	1260	1238	4342	4093
<b>Change from 2000</b>	8.0%		1.8%		6.1%	

**Attachment 2 (cont)****Purposes for Licences and Exemptions from Licence**

**Note:** A single licence may be granted for one or more purposes

**A**    *Granted or renewed in 2001*  
**B**    *Total current*

<b>A</b>	<b>B</b>	<b>Purpose</b>
1	1	Bone Densitometry
2	2	Bone Densitometry (Exemption)
25	36	Cabinet X-ray Equipment
	10	Cobalt Teletherapy Maintenance
15	36	Compliance Testing - Diagnostic X-ray Equipment
31	64	Compliance Testing - Radioactive Gauges
22	53	Education
50	71	Fluoroscopy - Medical
49	223	Fluoroscopy - Medical (Exemption)
1	1	Fluoroscopy - Medical (Non-Specialist Exemption)
3	3	Fluoroscopy - Research
0	1	Fluoroscopy - Veterinary
1	1	Gamma Irradiator - Use
69	170	Gauges - Industrial
3	12	Gauges - Industrial (Installation)
0	4	Gauges - Level (CO <sub>2</sub> )
42	94	Gauges - Logging
117	245	Gauges - Moisture and/or Density (Portable)
6	14	Gauges - Other
1	3	Installation of X-ray Equipment - Dental
4	21	Lasers - Acupuncture
0	5	Lasers - Chiropractic
1	10	Lasers - Dental
4	7	Lasers - Educational
3	4	Lasers - Entertainment
7	19	Lasers - Industrial
50	195	Lasers - Medical
24	58	Lasers - Physiotherapy
6	19	Lasers - Research
15	28	Lasers - Service
0	3	Lasers - Veterinary
0	1	Manufacture of Lasers and Laser Products

<b>A</b>	<b>B</b>	<b>Purpose</b>
2	4	Manufacture of X-ray Equipment
1	1	Medical Physics
61	126	Medical Radiology
1	3	Nuclear Medicine
2	16	Nuclear Medicine - Diagnostic
2	16	Nuclear Medicine - Therapeutic
0	2	Nuclear Medicine - Veterinary
10	15	Pathology Tests
7	9	Portable Mineral Analysers
0	2	Portable Mineral Analysers (X-ray)
0	3	Possession of X-ray Equipment – Diagnostic Medical
0	1	Quality Assurance Procedures
1	11	Radioactive Ores - Mining and/or Processing
2	6	Radioactive Substances - Calibration Sources
2	3	Radioactive Substances - Medical
19	38	Radioactive Substances - Sale
1	7	Radioactive Substances - Service of Devices
1	5	Radioactive Substances - Tracer Studies
2	3	Radioactive Substances - Tracer Studies (Industry)
22	46	Radiography - Chiropractic (Extended)
38	86	Radiography - Chiropractic (Restricted)
0	1	Radiography - Chiropractic Referrals (Exemption)
62	176	Radiography - Industrial (Gamma)
69	183	Radiography - Industrial (X-ray)
3	11	Radiography - Medical (Direction and Supervision)
13	14	Radiography - Osteopathy Referrals (Exemption)
167	453	Radiography - Veterinary
9	13	Radiopharmaceutical Manufacture and Dispensing
17	33	Radiotherapy - Medical
4	4	Radiotherapy - Medical
3	12	Radiotherapy - Medical Superficial
2	4	Radiotherapy - Veterinary
10	30	Research
43	96	Research - Unsealed Radioactive Substances
5	17	Sale of Electronic Products
17	40	Sale of X-ray Equipment
4	12	Service of X-ray Equipment - Analytical
1	9	Service of X-ray Equipment - Dental
19	39	Service of X-ray Equipment - Diagnostic
16	28	Service of X-ray Equipment - Diagnostic (Extended)

<b>A</b>	<b>B</b>	<b>Purpose</b>
2	3	Service of X-ray Equipment – High Energy Therapeutic
5	9	Service of X-ray Equipment - Industrial NDT
1	2	Service of X-ray Equipment - Intraoral
9	14	Service of X-ray Equipment - Linear Accelerators
1	12	Service of X-ray Equipment - Other
6	18	Special Purpose Enclosed X-ray Equipment
0	1	Static Elimination – Exemption
0	1	Static Detection
2	4	Storage
5	19	Transilluminators
22	57	Transport
0	2	X-ray Analysis
0	2	X-ray Analysis (Research)
24	55	X-ray Analysis - Use
26	57	X-ray Analysis - Use and Service (Restricted)

**Attachment 3**

**LEGISLATION AMENDMENTS**

**RADIATION SAFETY ACT**

None

**RADIATION SAFETY (GENERAL) REGULATIONS**

Radiation Safety (General) Amendment Regulations 2001

Dentists and chest x-ray referrals;  
Approved dental ancillary courses;  
Laser pointer amendments;  
X-ray operator assessment to 36 months.

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**RADIATION SAFETY (TRANSPORT OF RADIOACTIVE  
SUBSTANCES) REGULATIONS**

None

**RADIATION SAFETY (QUALIFICATIONS) AMENDMENT  
REGULATIONS**

None

## ABBREVIATIONS

### General Terminology

ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ARPANS Act	Australian Radiation Protection and Nuclear Safety Act
AS	Australian Standard
NHMRC	National Health and Medical Research Council
NORM	Naturally Occurring Radioactive Material
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material

### Units of Activity

Bq	becquerel (1 disintegration per second)
MBq	megabecquerel (1,000,000 becquerels)
GBq	gigabecquerel (1,000,000,000 becquerels)

### Units of Effective Dose

Sv	sievert (1 joule per kilogram multiplied by a modifying factor for the type of radiation and the radiological sensitivities of the organs and tissues being irradiated)
mSv	millisievert (one thousandth of a sievert)
μSv	microsievert (one millionth of a sievert)