Australian Government

Ansto

Nuclear-based science benefiting all Australians

Annual Report

2012-13

CHAIRMAN'S LETTER

Australian Government | ansto
Nuclear-based science benefiting all Australians

10 October 2013

The Hon Ian Macfarlane MP
Minister for Industry
Parliament House
CANBERRA ACT 2601

Dear Minister

In accordance with Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act), I am pleased to present the Annual Report of the Australian Nuclear Science and Technology Organisation (ANSTO) for the period 1 July 2012 to 30 June 2013. This report has been prepared in accordance with the requirements of the *Australian Nuclear Science and Technology Organisation Act 1987* (ANSTO Act) and in accordance with section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act).

Under section 9 of the CAC Act, ANSTO Board members must prepare an annual report in accordance with schedule 1 of the CAC Act, and are responsible for the preparation and contents of the Annual Report and its Operations prepared in accordance with the Finance Minister's Orders.

The report has been approved for presentation to you by a resolution of the ANSTO Board members on Wednesday 9 October 2013.

Yours sincerely

Dr Paul Greenfield AO
Chairman

AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
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CONTENTS

ABOUT ANSTO

For 60 years, the Australian Nuclear Science and Technology Organisation (ANSTO) has proudly been home to Australia's nuclear expertise.

Many of the most important questions facing society today are within the domain of this expertise; whether in the area of health, climate science or driving technology development for industry.

ANSTO has achieved many great research achievements this year from studies into miniature detectors to aid hadron therapy for cancer patients; research on ice and stalagmites to give us a window into past and future climate; work that is helping understand the mechanisms behind magnets and ferro-magnetic fields; and studies into new ways to diagnose stroke and degenerative neurological diseases.

ANSTO has over 1200 dedicated researchers, engineers and support staff who strive daily to exploit the opportunities nuclear science and technology can deliver, for the benefit of all Australians. More broadly ANSTO accommodates, on average, over 1800 visiting researchers from other Australian research organisations and international research centres each year. Through our international partnerships in the field of nuclear science and technology, ANSTO is enabling Australian researchers access to a global network of experts through European Organization for Nuclear Research (CERN) and its extended network of research programs.

ANSTO's strategic international collaborations ensure Australian scientists are connected with important global research projects. ANSTO's partnerships include agreements with Japan's High Energy Accelerator Research Organization (KEK); the French Atomic Energy Agency (CEA); and Shanghai Institute for Applied Physics (SINAP).

ANSTO is highly regarded in a complex area of expertise and it provides quality advice to the Federal Government on all matters relating to nuclear science, technology and engineering.

ANSTO is connected with all Australian and New Zealand universities through the Australian Institute of Nuclear Science and Engineering (AINSE), providing researchers access to Australia's nuclear science, technology and engineering expertise and landmark infrastructure which, in turn, facilitates greater national science collaboration.

ANSTO operates research facilities across three locations including Lucas Heights and Camperdown in Sydney and Clayton in Melbourne. At the heart of ANSTO's research capabilities is the OPAL reactor which is one of the world's most effective multi-purpose research reactors. OPAL is used for scientific research, the production of medical

Aerial photo of ANSTO's Lucas Heights campus

ANSTO graduate Stephanie Kermode and environmental scientist Henk Heijnis undertaking sediment core testing at Towra Point near Kurnell, NSW.

radioisotopes, and the irradiation of silicon used in microelectronics and other specialised irradiations for industry.

OPAL facilitates specialised research using a growing suite of neutron beam instruments at ANSTO's Bragg Institute where scientists apply neutron scattering and X-ray techniques to solve complex research and industrial problems such as developing renewable, clean energy technologies.

ANSTO also operates two particle accelerators, Small Tandem for Applied Research (STAR) and Australian National Tandem Research Accelerator (ANTARES), which are used to analyse materials to determine their elemental composition and age, and are fundamental to advancing knowledge in areas such as climate science through the study of tree rings and air pollution samples.

Development of the Australlian Government funded Centre for Accelerator Science at ANSTO is now well underway. The new centre will attract local and international scientists from a wide range of scientific disciplines working in areas such as radiocarbon dating and environmental studies, which are key in understanding past human activity and climate variability.

As part of a $100 million funding package, ANSTO assumed responsibility for operations of the Australian Synchrotron from 1 January 2013.

The Australian Synchrotron is a world-class research facility that uses accelerator technology to produce a powerful source of light – X-rays and infrared radiation, many times brighter than the sun servicing some 3000 registered users at Australian and New Zealand Universities and research institutes.

The facility has nine different experimental stations, or beamlines, which harness light to see the invisible structure and composition of materials from the macroscopic to the atomic - with a level of detail, speed and accuracy not possible in conventional laboratories.

The Australian Synchrotron supports a broad range of high quality research, with applications in medicine and nanotechnology, to manufacturing and mineral exploration.

ANSTO supports Australia's international roles and obligations, contributing to nuclear non-proliferation and making sure Australia has a seat at the table in international decision making about nuclear science and technology and related applications.

It is this specialist expertise that is also recognised internationally and on behalf of Australia, ANSTO holds a seat at the prestigious Board of Governors table at the International Atomic Energy Agency (IAEA) headquarters in Vienna.

ANSTO is also leading the way in nuclear security in the areas of nuclear forensics for border detector technology protection and nuclear non-proliferation to promote the peaceful uses of nuclear science and technology to benefit humankind.

For example, low enriched uranium, used to power Australia's OPAL research reactor is the safest nuclear fuel because of its proliferation resistance. The mass production of molybdenum-99 (Mo-99), used in 80 per cent of nuclear medicine procedures, using a low enriched uranium reactor is therefore a major advancement of Australia's regional and global leadership in nuclear medicines and will position Australia at the forefront of a global movement to eradicate the use of highly-enriched uranium.

ANSTO is central to Australia's nuclear medicine manufacturing capabilities. Each week ANSTO delivers 10,000 patient doses of potentially lifesaving nuclear medicines to over 250

partner hospitals and medical practices across Australia and the region. It's estimated one in two Australians will benefit from the nuclear medicines that originate from ANSTO at some point in their lifetime.

The minerals industry relies on ANSTO to provide advice and technology to handle naturally occurring radioactive materials in mineral processing. ANSTO also provides expert advice on the safe treatment and disposition of nuclear waste and specialised irradiation services.

Strategic priorities

Our strategic priorities for 2010-2015 are to:

- Deliver world-class research and innovation in nuclear science and technology
- Expand ANSTO's reach and contribution, exploiting landmark technologies
- Serve the nuclear needs of government, industry, community and the people of Australia
- Drive organisational renewal.

Our vision

To deliver excellence in innovation, insight and discovery through our people, partnerships, nuclear expertise and landmark infrastructure.

Our Corporate Plan 2010-2015

ANSTO Corporate Plan 2010-2015 is the enabling document for the organisation to implement our strategic priorities and vision. Approved by the ANSTO Board and accepted by the responsible Minister, the plan is a public document, available via the ANSTO website.

Statement of Compliance

This report is written with reference to the Commonwealth Authorities (Annual Reporting) Orders 2011.

Responsible Ministers

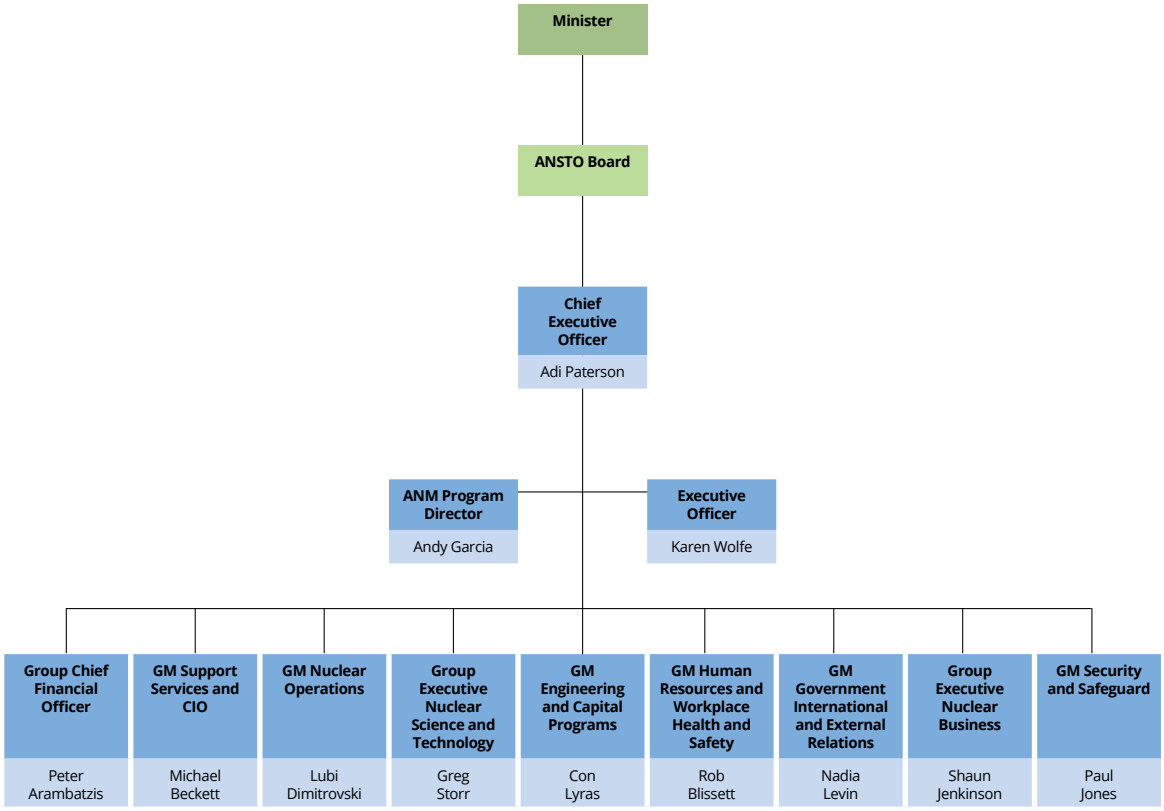
As at 30 June 2013 the responsible Ministers were:

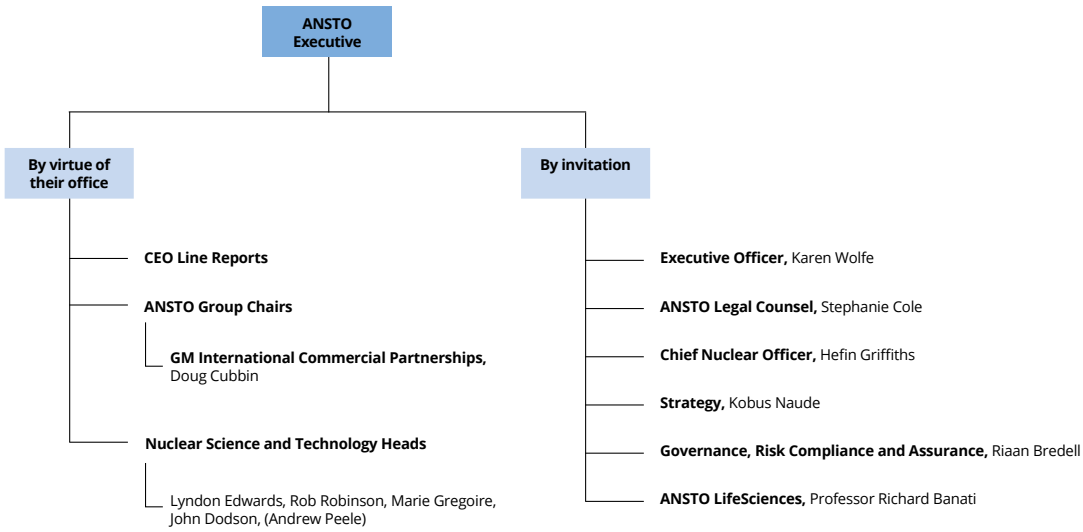
- The Hon Dr Craig Emerson (MP), Minister for Tertiary Education, Skills, Science and Research; and
- Senator the Hon Don Farrell, Minister for Science and Research.

Other responsible Ministers during the 2012-13 financial year reporting period were:

- The Hon Chris Bowen (MP) Minister for Tertiary Education, Skills, Science and Research from 4 February 2013 to 25 March 2013; and
- Senator the Hon Christopher Evans, Minister for Tertiary Education, Skills, Science and Research from 14 December 2011 to 4 February 2013.

ORGANISATIONAL CHART





MEMBERS OF THE BOARD

Dr Paul Greenfield AO (Chairman)

BE (Hons), B.Econ, PhD, FTSE, FIEAust, FIChE, FAICD, CPEng, CEng, CSci

Engineer.

Chairman since
24 February 2011

Appointed
25 July 2007

Appointed
25 July 2007

Reappointed
25 July 2010

Term concludes
24 July 2014

Professor David Copolov OAM

MBBS, PhD, FRACP, FRANZCP, MPM, DPM

Pro Vice-Chancellor, Office of the Vice-Chancellor and Professor of Psychiatry, Monash University; Academic and psychiatrist.

Appointed
1 May 2008

Reappointed
28 June 2012

Term concludes
27 June 2016

Ms Christine McLoughlin

BA, LLB(Hons), FAICD

Lawyer and businesswoman.

Appointed
13 March 2009

Term concludes
12 March 2013

Dr Susan Pond AM

BMBBS (Hons), MD, DSc, FTSE, FRACP

Adjunct Professor, University of Sydney Medicine; Scientist and businesswoman.

Appointed
1 July 2010

Term concludes
30 June 2014

Professor Judy A Raper

PhD, BE (Hons)

Deputy Vice-Chancellor (Research) University of Wollongong; Academic and engineer.

Appointed
28 June 2012

Term concludes
27 June 2016

Mr John Ryan PSM

BEc, MEc

Chair of ANSTO's Risk and Audit Committee from 1 July 2012; Executive Director, Cloon Economics and economist.

Appointed
24 February 2011

Term concludes
23 February 2016

Professor Andrew Scott

MBBS (Hons), MD, FRACP, DDU, FAICD

Director Ludwig Institute for Cancer Research; Nuclear medicine physician, scientist and academic.

Appointed
26 September 2007

Reappointed
29 September 2011

Term concludes
28 September 2016

Ms Erica Smyth

MSc, FAICD, FTSE

Scientist and businesswoman.

Appointed
12 December 2008

Reappointed
14 March 2013

Term concludes
13 March 2018

Dr Adrian (Adi) Paterson

BSc, PhD

Chief Executive Officer; Chemical engineer.

Appointed
1 March 2009

Term concludes
28 February 2014 *

** Incorrectly published as 27 June 2016. Corrected on 13 November 2013.*

ANSTO EXECUTIVE TEAM

Dr Adrian (Adi) Paterson
Chief Executive Officer

Mr Peter Arambatzis
Group Chief Financial Officer

Mr Michael Beckett
General Manager, Support Services and Chief Information Officer

Mr Robert (Rob) Blissett
General Manager, Human Resources and Workplace Health and Safety

Mr Douglas (Doug) Cubbin
General Manager, International Commercial Partnerships

Mr Lubi Dimitrovski
General Manager, Nuclear Operations

Professor John Dodson
Head, Institute for Environmental Research

Professor Lyndon Edwards
Head, Institute of Materials Engineering

Dr Marie-Claude Gregoire
Head, ANSTO LifeSciences

Mr Shaun Jenkinson
Group Executive, Nuclear Business

Mr Paul Jones
General Manager, Security and Safeguards

Ms Nadia Levin
General Manager, Government, International and External Relations

Mr Con Lyras
General Manager, Engineering and Capital Programs

Dr Robert (Rob) Robinson
Head, Bragg Institute

Dr Greg Storr
Group Executive, Nuclear Science and Technology

By invitation:

Professor Richard Banati
Distinguished Research Fellow and ANSTO LifeSciences

Mr Riaan Bredell
Senior Manager Governance, Risk, Compliance and Assurance

Ms Stephanie Cole
Legal Counsel

Mr Hefin Griffiths
Head of Nuclear Services and Chief Nuclear Officer, Nuclear Operations

Mr Kobus Naude
Senior Manager, Strategy and Planning

Ms Karen Wolfe
Executive Officer to CEO

CHAIRMAN'S REPORT

It has been a remarkable year at ANSTO and one that has undoubtedly made a significant impact on Australian innovation in science and health.

On 1 January 2013, ANSTO officially became the new operator of the Melbourne-based Australian Synchrotron. ANSTO has played a central role in the development of Australia's accelerator and synchrotron science facilities and, importantly, the development of a local user community.

Landmark infrastructure provides platforms for delivering cutting-edge instruments for local and global scientists, researchers and businesses to achieve excellent and useful outcomes.

Our key science investments in the Bragg Institute and the new facilities for the Centre for Accelerator Science have made excellent progress and are nearing readiness for operation.

All of these developments ensure Australia has the framework in place to retain its brightest minds, attract scientists from around the world, and collaborate as partners with organisations globally. In addition, we can be assured that Australian industry will not be left behind by technological developments internationally – so that our minerals specialists have the best advice available, our scarce water supplies can be used wisely, and Australian patients have access to the best possible diagnostics and treatments available.

The ANSTO Nuclear Medicine project, announced by the Australian Government in September 2012, reflects the Board's continuing commitment to nuclear medicine and providing for the healthcare needs of the nation.

This project will also be significant for the provision of nuclear medicine around the world, which is fundamentally changing because of the closure of ageing research reactors. We are justly proud of the OPAL research reactor as a world-class multi-purpose facility, and this project will enable Australia to become an important centre for nuclear medicine on the international stage.

It is difficult to overstate the importance of Australia's status as the world's first large-scale manufacturer of Molybdenum-99 sourced from low enriched uranium fuel and targets. This is considered extremely important for international nuclear non-proliferation and security goals – proving to the world that there is no need for research reactors to use highly enriched uranium in their fuel or targets and thereby supporting the Treaty on the Non-Proliferation of Nuclear Weapons.

ANSTO's leadership in the peaceful applications of nuclear technology is being recognised internationally. This was emphasised during the August 2012 visit of the Director General of the International Atomic Energy Agency (IAEA), Mr Yukiya Amano, who congratulated ANSTO for its initiatives in supplying nuclear medicine to the world and providing technical assistance to the IAEA.

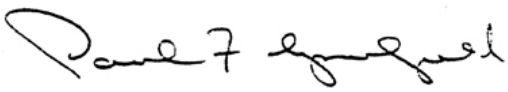
The announcement of the ANSTO Nuclear Medicine Project; bringing the management of the Australian Synchrotron under the ambit of ANSTO; and the commencement of construction of the Centre for Accelerator Science are of historic importance, not just for ANSTO, but for building the scientific infrastructure and capabilities of Australia.

I would like to commend Dr Paterson and his leadership team with all of ANSTO's dedicated staff for delivering benefits to all Australians through the use of nuclear science, technology and innovation.

During the year the Board, in addition to the normal cycle of meetings, held a strategy workshop in December 2012 and a risk review in February 2013, and expanded the number of onsite visits to facilities. Board members were also present at a parliamentary briefing on nuclear medicine's role in the fight against cancer which included a presentation from Professor Ian Olver, Chairman of Cancer Council Australia.

I would like to thank my fellow Board members for their commitment and intellectual rigour applied to the organisation's governance and to enhanced networking with external and internal stakeholders. It has been a privilege to work with you this year. In particular, I note with pleasure the re-appointment of Dr Erica Smyth for a further five years.

It has indeed been a remarkable year at ANSTO that sets the scene for many more exciting years of achievement to come.



Dr Paul Greenfield AO
Chairman

CHIEF EXECUTIVE OFFICER'S REPORT

The 2012-13 financial year represented a period of continued achievement and organisational renewal for ANSTO.

While our activities were very much about looking forward, we also spent time reflecting on the 60th anniversary of the formation of ANSTO's predecessor, the Australian Atomic Energy Commission. Much has changed over the past 60 years, and ANSTO has been instrumental in helping shape the landscape of Australian science, in partnership with an evolving and dynamic university sector and industry.

ANSTO has had a good year on a number of fronts, and through our landmark infrastructure we have enabled research in areas such as health, understanding our environment and driving innovation for industry.

Our collaborations and partnerships continue to grow and provide opportunities for great research in areas that are fundamental to healthy lifestyles in a sustainable environment. Nuclear applications play a significant role in our lives and in enabling us to understand the world around us and how to make a positive contribution to its future.

In the environmental arena, our researchers are working on fingerprinting atmospheric pollution in New South Wales; helping Western Australia understand the sustainability, or otherwise, of its water reserves; learning about the differences in carbon circulation between the Northern and Southern hemispheres; and studying how ice behaves under stress, something that is important in understanding the movement of glaciers.

Our health research covers topics as diverse as understanding the causes of coronary heart disease, stroke and neurodegenerative diseases like Alzheimer's and Parkinson's; studies that are making cancer medication doses safer and more effective; and the development of miniature radiation dose detectors to aid hadron therapy cancer treatment.

This year was a year of building on Australian collaborations with august organisations such as CERN (the European Organization for Nuclear Research) and the Japanese Spring-8 Centre, as well as major developments in Australian partnerships with the University of Sydney, Monash University, the Ludwig Institute for Cancer Research and Austin Health, among others. ANSTO is a firm believer that partnering is essential to achieve great outcomes, and sharing intellectual capabilities is as important as providing nationally significant platforms to enable great research, whether fundamental or applied, but always high value.

Reactor-based science, accelerator science and synchrotron science are essential for a nation's innovation capacity. The OPAL reactor operated for 265 days at high power in 2012-13 – putting OPAL in the leading ranks of research reactors worldwide. The first scheduled long shutdown of OPAL took place in December 2012, providing an opportunity to introduce new features into the facility that will enhance its capabilities. This included the installation of a third cold neutron guide to additional instruments. These instruments will provide enhanced capability in bio- and nano-science, in addition to meeting

unfulfilled excess demand from our users. This achievement is significant, not only because all work was completed safely ahead of schedule, which is testament to the strong commitment and rigorous standards of ANSTO staff, but also because it demonstrated strong teamwork from the diverse workgroups we have at ANSTO.

This teamwork was again demonstrated when ANSTO took on the role as operator of the Australian Synchrotron on 1 January 2013. It has been a successful transition, with minimal impact on the user program, and will continue to drive future funding and collaborations through our complementary sciences. The importance of this significant Australian infrastructure and its high impact links to industry cannot be underestimated. Securing its future remains a high priority.

Celebrating its 10th anniversary, ANSTO's Bragg Institute continues to grow in its significance for Australian science. An additional six neutron-scattering instruments, three of which were funded under a national Education Investment Fund (EIF) project, were under procurement or construction. In a relatively short period, the Bragg Institute has developed a worldwide community of scientists and engineers, with 721 scientists visiting since 2008 resulting in more than 1300 refereed research papers, with 319 scientific journal articles resulting directly from the user program at OPAL and the National Deuteration Facility.

I'm pleased to say that we've made great progress in the development of the Centre for Accelerator Science which will drive new capabilities for accelerator science in Australia. The centre's first new accelerator, funded by the Education Investment Fund, is due to open in 2014.

To ensure we can accommodate the needs of the future, our organisational framework has evolved from a single classic line framework to accommodate a new group structure with broader capacity to deliver on new opportunities and an even stronger governance and risk function with high visibility. These organisational changes are designed to increase our depth and focus on our nuclear capabilities and the peaceful uses of nuclear applications in the areas of human health, our changing environment and sustaining our future with a high quality of life. This new organisational framework will accommodate not only the operation of the Australian Synchrotron but also major infrastructure projects, including the ANSTO Nuclear Medicine (ANM) Project and Synroc waste treatment plant.

Importantly, the new Synroc plant will not only treat waste from the new nuclear medicine production plant, it also demonstrates the capacity of this Australian-developed technology to safely encapsulate and reduce the volume of waste.

The modernisation of ANSTO reaffirms the key role that a national scientific agency should and does play in its contribution to the broad national discourse as well as providing trusted advice to government.

Despite a challenging international economic environment, ANSTO Health's increased strategic focus on excellence and output has seen nuclear medicine export sales continue to grow significantly. In addition, a delivered in-full, on-time rate of over 95 per cent has generated direct and indirect savings to the organisation and is enhancing Australia's reputation as a major global contributor in this significant market.

It has been a solid growth year for ANSTO and I would like to thank my Executive Leadership Team for their strong performance and contribution.

I would also like to thank the ANSTO Board for its continued commitment to good governance that enables us to perform the work we do for the benefit of Australia.

Dr Adrian (Adi) Paterson
Chief Executive Officer

2012-13 HIGHLIGHTS

ANSTO Nuclear Medicine Project

In September 2012, the Australian Government announced a major $168.8 million investment in a new nuclear medicine facility that will enable ANSTO to continue supplying the medicines one in two Australians need and also supply a significant proportion of the world's demand for nuclear medicines.

The ANSTO Nuclear Medicine Project will include a modern nuclear medicine facility and a co-located Synroc waste treatment plant.

Synroc is an Australian innovation developed by scientists from ANSTO and the Australian National University that can reduce the volume of nuclear by-products by 99 per cent (compared to other methods such as cementation). ANSTO's Synroc waste treatment plant will deliver a permanent, safe and economical means of treating the necessary by-products of past, current and future nuclear medicine production. The project will also provide a demonstration pilot plant to sell this Australian innovation to international markets.

ANSTO has submitted the relevant licence applications and is working closely with Australia's independent nuclear regulator, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), to progress the project.

"Nuclear medicine plays a very important role in the quick and accurate diagnosis of serious illnesses to help kids get back on track to being healthy and happy. As one of the busiest paediatric nuclear medicine services in the Southern Hemisphere, it is essential that we have a reliable supply of nuclear medicines. ANSTO's ability to produce high quality nuclear medicines locally means we have an efficient and reliable supply, allowing us to focus on what's most important, our patients. Congratulations on 60 years of improving the health of all Australians."

Clinical Professor Robert Howman-Giles, Head, Department of Nuclear Medicine,

The Children's Hospital at Westmead

Artist impression of ANSTO's new nuclear medicine facility

Australian Synchrotron

On 1 January 2013, ANSTO became the operator of the Australian Synchrotron, bringing two of Australia's most significant science organisations together and advancing scientific outcomes for the nation.

In March 2012 the Australian and Victorian Governments announced the future of the Synchrotron had been secured through a $100 million, four-year funding arrangement that includes investment from the Australian, Victorian, New South Wales and New Zealand Governments and Australian universities. As part of the funding package, ANSTO will contribute $4 million as well as significant in-kind resources to the Australian Synchrotron over the next four years.

Bringing the Synchrotron under ANSTO's operation has enabled the two organisations to build on indelible links between the complementary sciences both organisations undertake: particularly neutron scattering science at ANSTO and accelerator science at the Australian Synchrotron.

The close collaboration between our organisations is long-standing, with ANSTO being a Foundation Investor in the Synchrotron.

As part of the arrangements a new operating company was established. The new company, named Synchrotron Light Source Australia Pty Ltd, is a wholly-owned subsidiary of ANSTO. While the Australian Synchrotron is to be operated by ANSTO, the facility is owned by the Victorian Government.

The Australian Synchrotron, opened in July 2007, is a third generation synchrotron light source located near Monash University's Clayton campus.

2012-13 HIGHLIGHTS

ANSTO welcomes IAEA Director General

In October 2012, ANSTO hosted an official visit from Mr Yukiya Amano, Director General of the International Atomic Energy Agency (IAEA). This important visit helped strengthen Australia's already solid relationship with the world's leading nuclear organisation and provided a forum to discuss new linkages and opportunities.

Australia has been a very active member of the IAEA from its inception and contributes generously to the IAEA's technical cooperation program, supports its non-proliferation efforts and actively supports regional projects.

Director General Amano met with senior officials and ANSTO CEO, Dr Adi Paterson and toured the OPAL research reactor.

The Director General congratulated Australia on its announcement to build an export nuclear medicine (Molybdenum-99 or Mo-99) manufacturing facility at ANSTO. Director General Amano said he was grateful for Australia's effort to significantly increase production of this important isotope in order to offset cuts in production elsewhere.

Director General Amano (fourth from left), ANSTO CEO Dr Adi Paterson (far left), senior ANSTO staff and officials visiting the OPAL pool.

(L-R) Dr Carl-Magnus Larsson, ARPANZA CEO; Director General Amano and ANSTO CEO Dr Adi Paterson in front of the OPAL reactor building.

OPAL long shutdown

After a number of years of successful operation, in 2012 OPAL was due for its first long shutdown. Long shutdown activities such as this are a routine part of operations for both research and power reactors around the world.

Commencing in November 2012, the six week long shutdown enabled specialised staff to undertake in-depth engineering and maintenance on certain reactor systems and check and rectify issues pertinent to efficient operation. The long shutdown also provided an opportunity to introduce features into the facility that will enable new applications to be accommodated in the future.

Activities during the long shutdown included installation of a third cold neutron guide called CG2. The CG2 is a split guide that will feed the Bilby small-angle neutron-scattering (SANS) instrument and allow for future expansion on the western side of the guide hall for an additional 2 to 3 instruments.

In addition, a large number of reactor maintenance activities were performed over the shutdown, including work on electrical, instrumentation, utilisation and safety systems.

The long shutdown was partly funded by the Australian Government Super Science investment and significantly enhanced the capabilities of the OPAL research reactor.

All work was completed safely and the reactor was returned to high power a day and a half before the scheduled 17 December 2012 deadline.

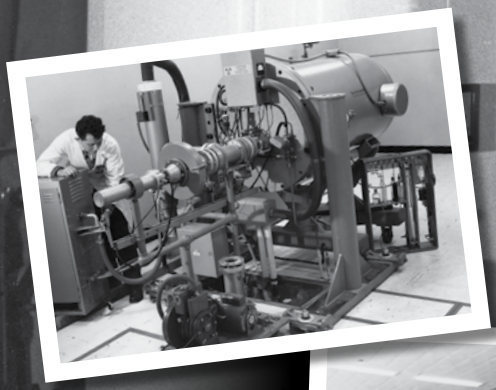
After opening in 2007, OPAL successfully completed its first long shutdown in 2012.

2012-13 HIGHLIGHTS

Celebrating 60 years of innovation

On 15 April 1953, Federal Parliament passed the *Atomic Energy Act* giving the Australian Atomic Energy Commission, formed the previous year, a statutory basis. The Act was Australia's first tentative steps along a scientific path that led to the formation of ANSTO – now one of our country's leading public research organisations.

ANSTO celebrated its first 60 years with the production of a commemorative booklet and iPad app. Developed in conjunction with COSMOS magazine, the booklet and app provided a snapshot of Australia's many achievements over the past six decades including the contribution of Australia's first reactor, HIFAR; the development of Australia's state-of-the-art OPAL research reactor; ANSTO's many scientific research achievements; and the organisation's major role in improving public health care through the production of nuclear medicine.



(L-R) ANSTO's 1.3 MV Van de Graaff electron accelerator; ANSTO's Library, Australia's most comprehensive centre for nuclear information, and ANSTO materials researchers on an early transmission electron microscope. All photos circa 1960, by Max Dupain.

60 YEARS OF DISCOVERY

Bragg Institute 10th anniversary

In addition to ANSTO's 60th anniversary in 2013, in 2012 ANSTO celebrated 10 years of the Bragg Institute.

Over its first decade, ANSTO's Bragg Institute has established itself as one of Australia's most significant scientific user platforms, with seven operating neutron beam instruments having been successfully constructed and commissioned, and a further six instruments under development.

The institute has also established a world-leading National Deuteration Facility that supports specialised research based on the distinct neutron scattering from hydrogen and deuterium. This important technique enables researchers to more effectively investigate the relationship between the structure and function of proteins, DNA, synthetic polymers and other materials known as 'soft matter'.

Researchers from 137 Australian and international research organisations have used the neutron beam instruments over the past 10 years, with over a thousand research articles being published in a range of high-quality journals. Enabled by OPAL, Bragg is well placed to continue to support research for many more decades to come.

"ANSTO plays an essential role in achieving our country's research priorities and regularly introduces nuclear innovations, for the benefit of all Australians, especially in the field of nuclear medicine. As the custodian of landmark infrastructure including Australia's OPAL nuclear reactor, a world class suite of neutron beam instruments, accelerators, and now the Australian Synchrotron. ANSTO provides the tools for researchers and businesses to achieve important research and innovation outcomes. Congratulations on 60 years of discovery and value creation."

Professor Ian Chubb AC,
Australia's Chief Scientist

Environment and climate science

Understanding changing rainfall through cave stalagmite studies

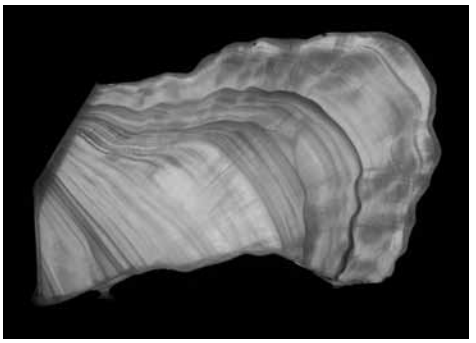
By using our techniques and expertise, ANSTO researchers have recently produced one of the longest cave monitoring datasets in Australia, from Golgotha Cave in south-west Western Australia. The data has confirmed the cave's suitability for gathering stalagmite-based rainfall records.

On average, there is now 17 per cent less rainfall across Western Australia's south-western region than was recorded prior to 1970. This rainfall reduction has economic, social and environmental implications for the region, including for the growing capital of Perth, and for important, water-dependent industries in the state.

Only short term rainfall records (110 years or so) are available to work with, so scientists researching the cause of this rainfall decrease need to apply different climate research methods to get a longer-term understanding of what is happening and why. Interestingly, it is cave stalagmites that are helping to provide the answers.

Cave stalagmites are a type of rock formation that rises from the floor of a cave due to the accumulation of material deposited on the floor from dripping water. These structures form slowly over thousands of years and with nuclear research techniques, scientists are able to use the stalagmites to help unlock thousands of years of rainfall-sensitive data, preserved in the crystallised calcium carbonate structure.

The first step in this process is to assess whether one of potentially hundreds of individual stalagmites in a cave is suitable for generating past climate records. That's where ANSTO comes in. ANSTO's researchers in Western Australia have studied and monitored drip water to find out how sensitive and accurate individual stalagmites are as indicators of rainfall and climate history.



Cross section of a cave stalagmite used for rainfall studies.

Ice studies unlocking the secrets of climate history

ANSTO's study on large ice samples using results of neutron experiments is helping explain the behaviour of ice, and more accurately model glacier movement, predict sea level rises and ultimately better understand the history of climate.

Predicting the behaviour of large masses of ice such as glaciers and polar ice sheets is challenging but essential for understanding climate history. Ironically, to better understand what is happening to these massive structures requires in-depth analysis at the atomic scale.

A neutron diffraction study conducted at ANSTO's OPAL research reactor aimed to determine principle mechanisms of ice deformation and provide quantitative characterisation of the processes and their evolution during ice plastic flow.

Health and life sciences

Dementia research to aid detection and treatment

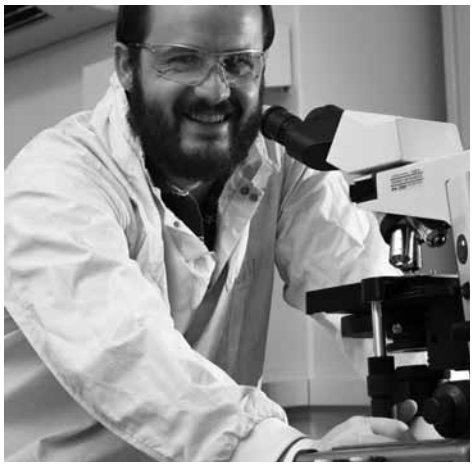
By measuring particle induced X-ray emissions in sections of inflamed rat brain tissue, scientists have been able to capture images of changes in calcium distribution. These images give potential insight into the early stages of dementia and help scientists better understand how these diseases start and progress.

Dementia is the most common cause of disability in Australians over the age of 65. The term 'dementia' actually encompasses more than 100 degenerative disorders, including Alzheimer's, Parkinson's and Huntington's diseases, that affect the central nervous system, and in particular the brain. In order to develop better treatments, we first need to better understand the basic underlying disease processes.

As a result of many successful health strategies, technologies and initiatives, life expectancy in Australia is higher now than ever before. Although this is a great thing, an increasingly ageing population comes with a number of challenges including a growing number of people with age-related disabilities.

We know that calcium plays an important role in neurons, which are cells that are essential for a healthy functioning human nervous system. An alteration in calcium homeostasis is one of the events known to initiate irreversible deterioration of the nervous system, which ultimately leads to degeneration of brain tissue.

It is hoped that the results of this research will enable scientists to not only detect these diseases before symptoms are visible, but also contribute to the development of better treatments.



ANSTO biologist, Nick Howell's research is contributing to better treatments for serious diseases such as Alzheimer's and Parkinson's.

New imaging agents to diagnose stroke

Stroke is Australia's second largest killer after coronary heart disease, and affected 60,000 Australians in 2011. Diagnosing a stroke as quickly as possible is the key to achieving positive outcomes for patients. By applying their knowledge of how cells behave in the event of a stroke, researchers from ANSTO and the French Atomic Energy Agency (CEA) have developed molecules that will help do just that.

The processes of cell division and programmed cell death - called apoptosis – keeps living organisms in a stable state. Between 50 and 70 billion cells die in an adult human every day. This happens by cells communicating with one another and activating a series of enzymes that initiate apoptosis. In some instances, programmed cell death can stop occurring normally, leading to disease. During a stroke, cells are starved of oxygen. This activates particular enzymes, called caspases, which then begin the process of cell death causing irreparable damage.

ANSTO and CEA scientists worked together on a joint research project to develop small molecules which can be radiolabelled with fluorine-18 and bound to the enzymes involved in apoptosis. The intention is that the compound can then, potentially, be injected into a patient so that a PET scan can reveal a picture of the affected brain area, allowing the stroke to be diagnosed more quickly.

It is intended that this Australian-French research will contribute to the development of an innovative new radiopharmaceutical that allows earlier diagnosis and greater treatment options for stroke patients.

Miniature radiation dose detectors to aid hadron therapy cancer treatment

New radiation therapy techniques using high energy charged particles, which are produced in particle accelerators, are used overseas for the effective treatment of a variety of radio-resistant cancers. Recent advances in particle accelerator technology have led to dedicated hospital based facilities, which use mainly protons and carbon ions, and are collectively known as hadron therapy facilities.

Hadron therapy is an alternative radiotherapy cancer treatment which is being increasingly used when other treatment options, such as conventional radiotherapy, cannot be employed because of risk to vital organs close to the tumour.

In order to improve hadron therapy treatment, it is vital to have an accurate measurement of the dose the patient is receiving, not only in the treatment area, but also in any surrounding critical organs such as the brain and nervous tissue, eyes, and reproductive organs.

A collaborative effort by scientists from ANSTO and the University of Wollongong has resulted in the development of a new, miniature radiation dose detector that uses silicon, similar to that used in the manufacture of computer processors and USB flash memory devices. Scientists have fabricated these detectors, called microdosimeters, to be equivalent in size to human cells, and they have been successfully tested at hadron therapy facilities in Japan and Germany.

Dale Prokopovich and his colleagues have developed radiation detectors with the potential to provide more accurate measurements of radiation.

Testing shows that these microdosimeters have the potential to provide a more accurate measurement of the biological radiation dose received by the area being treated and the surrounding organs. Further testing is now planned to continue developing and improving this cutting edge technology.

New South Wales is indeed proud to be home to ANSTO – Australia's centre of nuclear expertise.

Amongst their many areas of world class initiatives are the production and supply of lifesaving diagnostic nuclear medicines helping one in two Australians, enabling medical research which subsequently leads to new treatments for diseases such as Parkinson's, Alzheimer's and Multiple Sclerosis.

Our warmest congratulations are extended to ANSTO, together with our gratitude for their priceless contribution over 60 years, improving the lives of everyday Australians.

Professor Marie R Bashir AC CVO,
Governor of New South Wales

Research sheds light on Parkinson's and Alzheimer's diseases, and schizophrenia

Catriona Wimberley's research is improving our understanding of neurological diseases.

Degenerative neurological diseases, such as Parkinson's and Alzheimer's diseases or schizophrenia have devastating impacts on sufferers and their loved ones.

ANSTO researchers have conducted a study involving a data analysis method for estimating changes in physiological parameters over time. This work has made it possible for certain parameters to be applied to a broader range of experimental conditions and disease states than was previously possible, and is enabling researchers to better understand the extent to which changes in these parameters are due to a disease's progression or are a response to treatments.

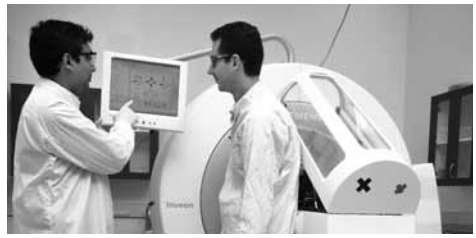
Positron Emission Tomography (PET) is a key medical imaging technique used to obtain three dimensional images of functional processes in the body, and used to monitor receptors in the central nervous systems associated with cognition, memory, learning, motivation, motor control and pleasure. Abnormal function of these receptors is a factor in degenerative neurological and neuropsychiatric diseases. These receptors are monitored within certain estimated physiological parameters from the PET scan. A better understanding of these parameters and how they change will lead to more accurate estimations and a better understanding of the diseases, their triggers and treatments.

Towards safer and more effective cancer medication

Treating cancer patients with drugs requires a fine balance between killing tumour cells without damaging normal cells, and managing the body's clearance of anti-cancer drugs so as to be effective without being toxic to the patient. If the body clears chemotherapy drugs too quickly, the tumour attacking action is lost, while slower metabolism of anti-cancer drugs results in higher concentrations of these drugs in the body which in turn causes toxicity and forces treatment to be delayed or stopped. A better understanding of how to achieve this fine balance will help in the treatment of cancer patients.

ANSTO and University of Sydney researchers have used the radiopharmaceutical technetium (^{99m}Tc) sestamibi (a pharmaceutical used in nuclear medicine imaging), which acts as a marker, to investigate drug clearance and toxicity. Cancer-free and cancer-bearing mice were studied using various medical imaging techniques to follow the distribution of the markers and better understand the underlying mechanisms in cancer treatment.

The new understanding of how to use medical imaging to monitor clearance of chemotherapy medication, gained through this study, can now be applied in future studies aimed at identifying patients at risk of toxicity. This will ultimately lead to better tailoring of medication doses for individual patients, which will make cancer treatment safer and more effective.



Research by Arvind Parmar (left) and Frederic Boisson is helping improve cancer patient treatments.

Materials engineering

Developing better performing information technologies

Magnets are used in components ranging from speakers, electric motors and some power plugs through to computer hard drives and automatic teller machine cards. Ferroelectric materials are used in some types of Random Access Memory (RAM) devices and in Radio Frequency Identification (RFID) equipment now being used for electronic toll collections on toll roads, security and access management systems and for tracking goods and animals.

Magnetic and ferroelectric materials are essential components in modern information technology.

Magnetic materials respond to changes in an applied magnetic field. These changes are usually 'remembered' after the field has been turned off. Similarly, ferroelectric materials have a spontaneous electric polarisation that can be reversed by applying an external electric field, and the new polarisation remains when the electric field is removed.

Magnetism and ferroelectricity are usually mutually exclusive. The handful of materials that are known to possess both magnetic and ferroelectric properties are called 'multiferroic'. Multiferroic materials have the potential to be extremely useful, for example, in the control of the magnetic components in memory-storage devices through electric manipulation, which provides faster storage and retrieval of information.

James Hester and Annemieke Mulders in front of ANSTO's High-Intensity Powder Diffractometer, Wombat.

The mechanisms underlying multiferroic behaviour are not always clear. ANSTO's studies in understanding these mechanisms will lead to development of higher-performing and more capable information technologies.

Semiconductor devices capable of withstanding harsh ionising radiation

Simple semiconductor test devices represent a basic PN junction structure which is the fundamental building block of all semiconducting devices including particle detectors, micro dosimeters, solar cells, LEDs, power switchers, computing chips (microprocessors) and quantum bits.

Studies performed at ANSTO's microprobe facility are helping to understand, model and predict the detrimental influence of ionising radiation on semiconducting materials, in order to develop detectors and devices that are able to better withstand the damaging effects of high energy particles present in harsh radiation environments.

A high frequency raster-scanned focused beam of accelerated ions is used to create well-defined modifications in semiconductors. These act as traps for generated charge carriers (electrons and holes) in operating devices.

By measuring and modelling of the changed electronic properties in the presence of traps, the researchers characterise those defects in implanted/irradiated semiconductor devices both qualitatively and quantitatively.

Studies to improve storage and immobilisation of nuclear waste

Technetium is a rare element that was discovered more than 80 years ago and is found on Earth in very few locations and at extremely low concentrations. It is the lightest element that does not have a stable (i.e. non-radioactive) isotope and for this reason the chemistry and physics of technetium containing materials have barely been explored.

Despite this, Technetium is an important element to study because it is one of the most commonly used radiopharmaceuticals and forms a critical part of the nuclear fuel cycle. Its presence in used fuel elements poses significant nuclear waste management challenges.

In recent ANSTO studies of ternary technetium oxides, researchers discovered that these oxides possess very unusual physical properties.

Neutron diffraction studies at ANSTO's OPAL research reactor were used to shed light on the magnetic structure of technates and provided essential information for further theoretical studies of magnetism in technetium oxides.

The knowledge gained from this and subsequent studies will help us better understand chemical and physical properties of technetium compounds, and thus open new ways to improving methods for storing and immobilising technetium containing nuclear waste.

(L-R) Gordon Thorogood, Brendan J. Kennedy, and Max Avdeev next to ANSTO's High Resolution Powder Diffractometer, Echidna.

Operation of OPAL and other facilities

OPAL nuclear research reactor

OPAL continues to demonstrate it remains one of the world's most highly available multipurpose research reactors. In the 2012-13 financial year, the OPAL research reactor operated for 265 days at high power. The level of planned availability against the schedule was 97 per cent, maintaining the high result of the previous financial year as shown in the Key Performance Indicators shown on page 38.

OPAL undertook a planned extensive six week shutdown during the 2012-13 financial year which included a modification to install a major new beam line for neutron scattering science purposes. This investment increases OPAL's research capabilities.

Successful production of reactor based radiopharmaceuticals, neutron activation analysis for scientific research, and irradiation of neutron transmutation doped silicon was achieved during the year. The efficiency of the delivery of these products and services was enhanced through the ANSTO wide operational excellence program.

The Cold Neutron Source, which supplies important low-energy neutrons for research, was modified during the year to provide greater availability and reliability in operation. The cold neutrons provide the ability for studying superconductivity, magnetic, and other quantum effects that occur in materials at very low temperatures.

ANSTO plans to operate the OPAL reactor for about 295 days in 2013-14.

ANSTO's OPAL research reactor building.

Neutron-beam instruments

ANSTO's Bragg Institute is home to seven operational neutron-beam instruments which use OPAL's neutrons for solving complex research and industrial problems.

Neutron scattering allows scientists to see what X-rays cannot. Neutrons are used to see the internal structure of many classes of materials, thus helping scientists understand why materials have the properties that they do, and helping tailor new materials that suit specific technological needs in computing, refrigeration, mobile batteries, solar cells, renewable plastic packaging and medicine.

Six additional neutron-scattering instruments were under procurement or construction during 2012-13, three of which were funded under a national Education Investment Fund (EIF) project.

As part of ANSTO's mission to promote neutron-scattering applications and the training of scientists in the Asia-Pacific region, the Bragg Institute supported and hosted a number of regional activities through the year. In October 2012, ANSTO provided neutron instrument beam time and data to the Asia-Oceania Neutron Scattering Association (AONSA) Neutron Scattering School held at Peking University, Beijing, China. This support was provided as the neutron-scattering instruments and research program had not yet been initiated at the 60 MW China Advanced Research Reactor (CARR). The institute also welcomed a scientific visit from Indonesia's National Nuclear Energy Agency (BATAN) Neutron Scattering Laboratory to explore collaboration between our neutron scattering research groups, and a six month visit of an instrument scientist from the China Institute of Atomic Energy (CIAE) to undergo training with our instrument scientists on the use of our KOWARI strain scanner in preparation for the operation of the texture diffractometer at the CARR. Both visits were supported by IAEA Technical Cooperation Projects.

Attendees of the 2012 Conference on Small-Angle Scattering during their tour of ANSTO.

In 2012 ANSTO hosted a number of significant conferences and workshops including the International Conference on Small-Angle Scattering (SAS2012), the 7th International Sample Environment at Neutron Scattering Facilities Workshop and a Scoping Workshop for a Second Neutron Guide Hall at ANSTO to consider the possibilities for a second cold source, a hot source, positron science, fundamental neutron-based physics and the possibility of doubling the present number of instruments, using purposed-designed and optimised guides in a second guide hall on the south side of the reactor.

The Australian Synchrotron

In the 2012-13 financial year the Australian Synchrotron performed more than 800 experiments and supported more than 3500 researcher visits. In the same year science outputs continued to grow with more than 330 scientific publications, many in leading journals such as *Nature and Science*.

Some research highlights for the year include:

- World's first three-dimensional pictures of insulin in the process of binding to its receptor captured. Published in *Nature* these results may lead to more robust forms of synthetic insulin making it easier for patients to store and use insulin

- Work demonstrating hydrogen storage and release from materials exceeding the US Department of Energy's development storage target for 2015 by 50 per cent
- Close-up analysis for the Western Australian Museum of the De Vlamingh plate – the oldest European written artefact in the country – revealing hitherto unknown details of its history after being left by Dutch explorers in 1697
- Demonstrations of materials used for drug delivery including a molecule that releases its payload under light stimulation which has potential for applications treating diseases in the eye

The Australian Synchrotron remains able to deliver world-class, and in many cases world-leading, scientific capability by continually enhancing its capabilities. The top-up mode of delivering beam time is a successful demonstration of this; the facility successfully ran a full year of operations in top-up mode, providing a more stable supply of photons for improved researcher experiments. The Imaging and Medical Beamline also reached significant milestones and is developing into a unique and powerful resource for medical researchers. During the year commissioning operations commenced, including pre-clinical microbeam radiation therapy, and computed tomography imaging studies of vascular and lung function. Resources for scientific computing are another capability that has come online during the year with remote access, development of on-site data processing and access to high performance computing all enabled for the benefit of researchers.

The Australian Synchrotron has nine different experimental stations or beamlines.

Radiopharmaceutical production

Each week ANSTO Health delivers 10,000 patient doses of potentially lifesaving nuclear medicines to over 250 partner hospitals and medical practices across Australia. These nuclear medicines, which can only be produced in a research reactor such as ANSTO's state-of-the-art OPAL reactor, are used to diagnose and treat a wide range of illnesses such as cardiac conditions and cancer.

ANSTO's Mo-99 processing facility recovers, separates and purifies the Mo-99 to meet the demand for this important radiopharmaceutical. This product is exported to Southeast Asia, the USA and South Africa.

The other radiopharmaceuticals distributed to over 220 nuclear medicine centres across Australia and New Zealand are iodine-131 (I-131) for the diagnosis and treatment of thyroid cancer and hyperthyroidism; gallium-67 (Ga-67) to determine the extent of Hodgkin's disease, lymphomas and bronchogenic carcinoma; and iodine-123 mIBG (I-123) for detection, staging and follow-up to therapy for neuroblastomas.

The OPAL reactor provides a consistently reliable supply of radiopharmaceuticals for Australians.

The ANSTO designed Gentech® Generator.

"Nuclear Medicine helps us diagnose and treat a growing range of illnesses, most commonly heart disease, cancers and skeletal injuries. Accurate diagnosis is key to effective treatment. ANSTO provides over 85% of nuclear medicine radiopharmaceuticals used in Australia, providing an essential clinical service to the thousands of patients every year. Congratulations ANSTO on 60 years of service to the Australian community."

Dr Peter Lin, Director of Nuclear Medicine, Liverpool Hospital

Accelerators

Accelerators are used to analyse materials, often using extremely small samples, to determine their elemental composition and age to help understand human history and the environment. ANSTO currently has two accelerators, ANTARES and STAR, both of which are used in ion beam analysis and accelerator mass spectrometry.

STAR and ANTARES have been used to solve historical mysteries such as the earliest dental filling dated to 6500 years ago, dating Aboriginal rock art, as well as providing important measurements of dust and pollutants in the air.

ANSTO is well underway to completing the construction of the Centre for Accelerator Science (CAS) at Lucas Heights, with a $25 million grant funded by the national Education Investment Fund (EIF) project, and a further contribution by ANSTO bringing the total to $38 million.

The centre, which is expected to be completed in 2014, will house ANTARES and STAR, as well as two new accelerators - a low-energy multi-isotope accelerator mass spectrometer and a new medium-energy tandem accelerator adding to the scope of accelerator research undertaken in Australia.

The centre will act as a strong drawcard for Australian and overseas scientists from nearly every scientific field, working in areas such as radiocarbon dating and environmental studies.

ANSTO environmental scientist, Mike Hotchkis, in front of the ANTARES particle accelerator.

National Deuteration Facility

ANSTO's National Deuteration Facility enables scientists to more effectively investigate the relationship between the structure and function of proteins, DNA, synthetic polymers and other materials known as 'soft matter'.

The facility offers the capability to produce molecules where all or part of the molecular hydrogen is in the form of the stable non-radioactive isotope of hydrogen called deuterium.

Deuteration of parts of a molecule creates visible contrast between those parts containing deuterium and those with normal hydrogen, thus providing more

information about the molecular structure when a neutron scattering experiment is done at OPAL.

Deuteration allows particular parts of molecules to be highlighted (or painted) so that they show up markedly against the background of the other parts (which would otherwise be indistinguishable).

Molecular deuteration assists in making it possible to observe the arrangement of sub-units of an enzyme, or changes in shape when molecules interact or become active or inactive. This can be done with molecules in solution under relevant real life conditions.

The technique is used for research into areas such as Alzheimer's and Parkinson's diseases, the behaviour of environmentally friendly plastics and the development of new nano and biotech materials.

Irradiation facility

ANSTO's irradiation facility, known as GATRI (Gamma Technology Research Irradiator), is used to irradiate items for medical health, industry, agriculture and research. GATRI is the only Australian provider of high precision irradiation services including:

- Underpinning the sterility of donated human bone and tendons for transplants and grafting in surgery, leading to improved outcomes for patients
- Irradiation of the Queensland fruit fly to help control infestations
- Food irradiation research as an alternative to pesticide use for postharvest treatments to improve export market access. ANSTO supports investigations into food quality, nutritional and other effects for various fruits and vegetables.
- The development of a universal influenza vaccine using ionising radiation to inactivate the virus
- Irradiation of quarantined goods
- Plant mutation studies
- Sterilisation of medical products
- Accelerating long term radiation damage to plastics and electronics
- Assisting researchers at universities in developing meta-materials for multifunction applications.

The GATRI pool.

Community and education

ANSTO takes its role as a national science agency very seriously. Technology development is the key to ANSTO's future therefore enabling and exciting the next generation of bright minds to keep doing the great work already undertaken is essential for a better tomorrow. ANSTO is achieving this through its education and tours programs.

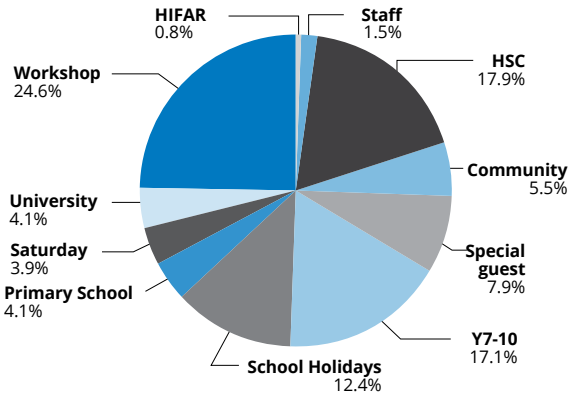
A record number of 11,780 visitors participated in free guided tours of ANSTO's Lucas Heights facilities. This represents an 8 per cent increase on the previous year and a 98 per cent increase on the number of visitations from six years ago. Of these visitors, 147 were HSC school groups, 24 were years 7-10 student groups and 16 were primary school groups.

ANSTO's other educational initiatives have also continued to grow:

- The Fact or Fiction show was held in Western Sydney, Melbourne and Hobart with over 4,900 people attending the events. The show frequently attracts media coverage in these different locations and will be expanded to include eight cities in 2013-14.
- The Science Workshop for Kids school holiday program has grown with three new workshops. This series is now so popular with children and parents that the allotted ten sessions book out weeks in advance.
- Professional Development for science teachers expanded to include Lab Technicians days and career specific events for year 10 and 11 students. Several teachers have commented that the ANSTO events are the best that they have ever attended.
- Delivery of over 21 outreach activities including participation in major local community events, teacher conferences and school events in Sydney as well as regional centres such as Lismore, Wagga Wagga, Narrabri and Wollongong.

Finally, a lot of work has been undertaken in preparing virtual tours of OPAL and the neutron beam facilities. These guided tours will be delivered via video conferencing to schools across Australia with a target of reaching an additional 10,000 students per year before the end of 2016.

Tour Types



Kids participating in the Secret Agents workshop

ANSTO's Fact or Fiction events attracted over 4,900 people

Sponsorship and events

ANSTO's sponsorships and events target our many important stakeholders from the local community, to universities and other research organisations, schools, and our government stakeholders. ANSTO uses sponsorship and event opportunities to actively engage and inform these stakeholders about the role ANSTO plays in contributing to health, environment and industry.

ANSTO continued its involvement with the Fulbright Scholarship in Nuclear Science and Technology and the Australian Museum Eureka Prizes through the ANSTO Eureka Prize for Innovative Use of Technology, awarded in 2012 to the Monash Team of Bioactive Paper Diagnostics from Monash University.

A new initiative is the collaboration with Operation Art, a program by the Children's Hospital at Westmead and the New South Wales' Department of Education and Communities inviting all schools from around the state to submit artwork for display in hospitals and for the best works to be displayed at the Art Gallery of New South Wales.

Another health-related activity is ANSTO's involvement in the Sutherland Shire Relay For Life, a major event organised by local volunteers and Cancer Council NSW. By supporting this event as a sponsor and through participating staff teams, ANSTO was able to discuss the role of nuclear medicine in early and accurate cancer diagnosis with members of the community.

ANSTO continued its support for community and industry events such as the Sutherland Shire Australia Day celebration, the Innovation Series events; Science meets Parliament and the Australian Academy of Technological Sciences and Engineering's (ATSE) Clunies Ross Awards.

Education activities remained a focus, including support for the Synchrotron and Neutron New User Symposium, the Australian Museum Science Festival, the National Youth Science Forum (NYSF), support for the Engadine High School's F1 in Schools project and sponsoring two high school students attending the International Science Olympiads.

ANSTO also engaged with the scientific audience of potential users and collaborators by supporting selected Australian and international conferences and workshops, including the International Small Angle Scattering conference, the Italian-Australian Bilateral Workshop on Nanostructured Materials and the Australian Institute of Physics Congress.

ANSTO's stall at the Sutherland Shire Relay for Life event.

ANSTO CEO, Adi Paterson and Chair of the Operation Art Management Committee, Joanna Capon OAM with Operations Arts entrants.

Businesses

External earnings by ANSTO's business and commercial groups remained strong, despite a tough financial climate, amounting to $54.3 million in the 2012-13 financial year.

ANSTO Health

ANSTO Health is the commercial division of ANSTO that produces radiopharmaceuticals in Australia and operates a production facility from ANSTO's southern Sydney campus. ANSTO Health plays an important role in the nuclear medicine and health industries in Australia, supplying 10,000 patient doses of potentially lifesaving nuclear medicines each week.

The ANSTO Health business continues to grow, and as mentioned previously, now exports Mo-99 to the USA. ANSTO Health's revenue earning was $29.6 million in 2012-13. This was up $1.37 million from the previous year.

On average, one in two Australians will benefit from a nuclear medicine in their lifetime.

Export Low Enriched Uranium Mo-99

The Mo-99 produced by ANSTO uses Low Enriched Uranium (LEU) as both the starter material and the fuel for OPAL, consistent with ANSTO's support of non-proliferation. In 2011-12, after meeting Australia's Mo-99 requirements, ANSTO Health exported the product to the USA, Japan, China and Korea.

During April and May ANSTO played a critical role in providing Mo-99 to US suppliers, while the Canadian reactor was unavailable, due to an extended planned shutdown. Support from ANSTO was critical to ensure important diagnostic imaging was maintained for the US health system.

PETNET

PETNET Australia Pty Ltd (trading as PETNET Solutions), is a wholly owned subsidiary of ANSTO, which operates two medical cyclotrons for radiopharmaceutical production at the southern Sydney campus through an agreement with Siemens Medical Solutions.

PETNET has routinely supplied NSW hospitals as part of the state tender and continues to hold a strong market share based on its value proposition of reliable supply of quality product.

PETNET's revenue earnings for 2012-13 were $2.8 million.

Neutron transmutation doping (NTD) silicon

ANSTO silicon revenue earnings for 2012-13 were $3.2 million. This was a decrease over prior year driven by a significant short-term downturn in the global market. During the period ANSTO silicon increased its market share, establishing ANSTO as the leading provider of NTD silicon irradiation services globally.

ANSTO silicon continued to grow its market by delivering high quality consistent irradiation of silicon ingots that are used in high end electronic switching devices. These devices are used in a range of applications such as power infrastructure, high speed trains and to facilitate the development of energy from renewable sources such as wind.

ANSTO Minerals

ANSTO Minerals, a business unit of ANSTO, provides consultancy services for the minerals industry, which includes undertaking applied research to develop processes for the treatment of ores containing, uranium, rare earths and other critical metals. New process ideas are first

investigated and refined at the laboratory scale. The next stage of validation typically involves operation on a larger continuous scale for extended periods. Minerals has established a distinctive mix of facilities to allow scale up of a range of unit operations including roasting, leaching, solid/liquid separation, multi-stage solvent extraction, ion exchange and precipitation. The Minerals facility precinct is well placed to cater for such activities at both a mini-plant or larger, fully integrated pilot/demonstration plant scale.

ANSTO Minerals revenue earnings for 2012-13 were $11.7 million. While this was a decrease over prior year it was a strong performance in a market that has experienced some uncertainty during the period.

ANSTO Minerals main building.

External radiation services

ANSTO is the leading provider of radiation protection services and advice in Australia. ANSTO has practical expertise in almost all facets of radiation safety and dealing with radioactive materials. Services are tailored to client requirements. They include radiation safety training, radiation protection advice, measurement and management plan development and reviews, radiation instrument calibration, systems safety and reliability consultancy.

ANSTO also provides services and advice in high-dose irradiation and high-dose dosimetry for scientific research and the provision of irradiation services to health care, agriculture and industry clients.

Australia's nuclear experts

Regional engagement across the Asia-Pacific

In this the 'Asian Century', ANSTO continues to play an important role in helping develop technical expertise in nuclear science and technology applications in developing countries in the Asia-Pacific region.

ANSTO's engagement in multilateral agreements and forums such as the Regional Cooperative Agreement (RCA) and the Forum for Nuclear Cooperation in Asia (FNCA) provides significant outreach into the region. During the year, with the sanction of the Joint Standing Committee on Treaties, Australia ratified the extension of the 1987 Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (RCA). Many ANSTO scientists contribute to the programs of both the RCA and the FNCA. For example, ANSTO was represented in a new RCA project that will enhance regional capabilities in source apportionment and fingerprinting of air particulate matter pollution in urban areas of RCA Member States through the use of nuclear analytical techniques. The project kicked off in Kajang, Malaysia in July 2012 and will help tackle the chronic levels of air pollution common in many of the largest Asian cities, causing significant detriment to human health.

ANSTO continues to engage in the region through expert participation in technical cooperation projects of the FNCA, again, designed to improve the efficiency and

safety of nuclear applications, particularly in developing countries. ANSTO is leading a project aimed at improving safety management practices, and overall safety culture, at nuclear research facilities in the region. That project (Safety Management Systems) has identified key aspects of safety management systems for nuclear research facilities and developed self-assessment and peer review methodologies for safety management. The most recent workshop and peer review for the project was held in Korea in November 2012.

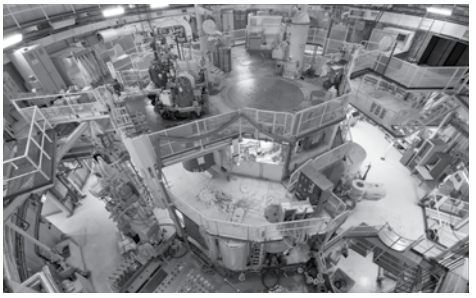
Globally recognised Australian expertise

During the year, ANSTO became a member of the Advisory Group on Nuclear Security (AdSec) and attended the first meeting in April. AdSec provides the Director General of the IAEA with expert advice on current and emerging nuclear security issues and delivers recommendations to strengthen the IAEA's role in nuclear security. AdSec will provide guidance on the agency's nuclear security priorities and review the agency's current and proposed nuclear security activities.

ANSTO participated in the IAEA's Standing Advisory Group on Nuclear Applications (SAGNA) meeting in May. SAGNA provides advice on IAEA activities in food and agriculture, human health, water resources, assessment and management of the marine and terrestrial environments, and radioisotope production and radiation technology programs. The meeting focused on the planning and implementation of nuclear techniques for environmental protection.

ANSTO continued to chair the International Expert Group on Nuclear Liability (INLEX) which provides a forum to explore and advise the IAEA on issues related to nuclear liability. During the year, ANSTO provided advice to policymakers and senior officials in Vietnam on international instruments relevant for achieving a global nuclear liability regime and on proposed amendments to their national nuclear law.

ANSTO attended the IAEA's International Decommissioning Network (IDN) Steering Committee. ANSTO expertise, gained from the successful decommissioning of Moata, and the current HIFAR decommissioning project, is assisting the IAEA to promote prompt, open and efficient worldwide sharing of practical and effective decommissioning experiences.



Australia's first reactor, the High Flux Australian Reactor (HIFAR), was shutdown in 2007.

"I'm very proud of my long association with ANSTO. I was fortunate to complete my PhD at ANSTO in the 1970s and go on to become a Board member and later the Chairman between 2007-2010. ANSTO plays a critical role in ensuring our Government is informed on all matters relating to nuclear science and its great benefit to humanity to nuclear safeguards and security, including arcane matters relating to non-proliferation and advice on nuclear innovations and sustainable and solutions for industry. Congratulations to ANSTO on 60 years."

Dr Ziggy Switkowski,
Chancellor RMIT University and former ANSTO Chairman

IAEA Coordinated Research Projects

The past year has seen an unprecedented number of ANSTO experts participating in the IAEA's Coordinated Research Projects (CRPs). The program encourages the acquisition and dissemination of new knowledge from the use of nuclear technologies and isotopic techniques.

There were 111 individual CRPs underway during the past year, 48 with Australian participation, and 19 with ANSTO experts in key roles. The project topics cover all ANSTO's research areas and provide opportunities for ANSTO scientists and engineers to engage in their specialities with counterparts in other IAEA member countries.

Each participating country brings to the project its own particular issue on the project topic to be shared and discussed, drawing on the collective knowledge, experience and expertise of the project participants in working through those issues.

Major security training exercise

In April, ANSTO hosted the major annual Australian New Zealand Counter Terrorism exercise.

Similar training exercises are routinely conducted at major airports, transport hubs and key infrastructure locations across Australia providing an opportunity to test existing security arrangements and build stronger inter-government networks ensuring the integrity of Australia's key infrastructure remains strong.

Exercise 'Baryon' was composed of several components including the real-time deployment exercise held on-site at ANSTO in April. The exercise, approved by the Australian New Zealand Counter Terrorism Committee, involved; ANSTO, the NSW Police Force, the Australia Federal Police, Fire and Rescue NSW, the Ambulance Service of NSW, the Australian Defence Force and the Australian Government's Attorney General's Department.

The exercise was a rare opportunity for state and national emergency services to practice working together on an emergency scenario that was specific to ANSTO's Lucas Heights campus, and to reassure the community about our ability to respond to this and other types of incidents.

Partnerships and associations

Asia Oceania Forum for Synchrotron Radiation Research

The Asia Oceania Forum for Synchrotron Radiation Research (AOFSRR) is an association of all synchrotron operating and user nations in the broad Asian region. Its mission is to strengthen regional cooperation in, and to promote the advancement of, synchrotron radiation research in the Asia Oceania region. ANSTO has had a close association with the AOFSRR since its inception in 2006, when the ANSTO operated Australian Synchrotron Research Program joined as a foundation member representing Australia. Richard Garrett has served as treasurer and member of the AOFSRR executive since this time. In 2011 ANSTO offered its services as financial manager of the AOFSRR, to facilitate the payment of membership fees by the eight full member nations. This offer was taken up and in July 2012 ANSTO signed three-way membership agreements with the AOFSRR and the membership holding organisations in Australia, China, India, Japan, South Korea, Singapore, Taiwan and Thailand to cover the collection and expenditure of membership fees.

Australian Institute of Nuclear Science and Engineering

The Australian Institute of Nuclear Science and Engineering (AINSE) provides a platform for training and cooperation in the nuclear science and engineering fields. Its membership comprises 46 Australian and New Zealand universities and science organisations, including ANSTO, making it one of few scientific institutions with such a wide membership. AINSE facilitates access to ANSTO and other associated nuclear capabilities through research grants, fellowships and support for conferences and workshops.

CERN (the European Organization for Nuclear Research)

ANSTO has a formal agreement with the European Organization for Nuclear Research (CERN) which allows scientists affiliated with each organisation to collaborate and receive reciprocal use of equipment. This means scientists from CERN benefit from access to ANSTO's facilities, including the OPAL reactor.

The agreement is laying a pathway for collaborative research by Australia's best and brightest scientists in areas such as accelerator science, health and life sciences, information technology and radiation detection.

By engaging with CERN, ANSTO and Australia are benefiting from cutting-edge research and are able to develop expertise in areas such as particle-therapy platforms and large-scale accelerator facilities.

The collaboration also involves the joint supervision of research students, staff exchanges and negotiated arrangements for the exploitation of intellectual property.

Cooperative Research Centre for Polymers

ANSTO continued its involvement in the Cooperative Research Centre for Polymers (CRC-P), a national research cooperative made up of universities and research facilities that is assisting to boost Australia's $9 billion polymers industry.

The initiative features a novel degradable plastic film that Greening Australia and the Birchip Cropping Group have shown can dramatically improve the re-establishment of native woodlands.

The initiative will bring science and industry together to develop products that meet emerging global needs in three areas - health therapies and delivery, water and food security, and low-cost solar energy - using enabling advanced polymer technology.

Polymers include plastics, and more than $9 billion worth of polymers and polymer-based products are used annually in almost all sectors of the Australian economy. The CRC-P has a strong track record of developing technologies for the plastics industry, including ceramifying polymer technology, first used in 2003 by Australia's Olex Cables in a new range of fire performance cables.

In the current period of funding the CRC-P will help Australian manufacturers develop new products through clever chemistry and strong industry collaboration.

Defence Science and Technology Organisation

ANSTO and the Defence Science and Technology Organisation (DSTO) signed a new partnership agreement in early 2013 that covers a number of joint activities and projects including Whole-of-Government Radiological and Nuclear Gamma Spectrum Database that will enable Australian emergency services and federal and state law enforcement agencies to more rapidly identify and deal with suspect objects. The database will hold measurements of gamma ray signatures emitted by nuclear and other radioactive materials, and the information will be made available to first responders and other national security agencies. This is a risk mitigating approach and provides better protection for emergency services and, overall, will provide a safer Australia.

Japanese SPring-8 Centre

ANSTO has a Memorandum of Understanding (MoU) with the Japanese SPring-8 Centre that will give Australian scientists access to its world leading photon science facility – 'the Spring-8 Angstrom Compact free-electron Laser (SACLA)'.

The MoU was signed on behalf of the Australian Collaboration for Accelerator Science (ACAS), meaning the benefits are extending to ANSTO's ACAS partners which are Melbourne University, the Australian National University and the Australian Synchrotron.

The agreement has opened up opportunities for collaboration amongst Australian and overseas scientists to undertake reciprocal visits and facilitate greater co-operation.

Ludwig Institute for Cancer Research and Austin Health

ANSTO's partnership with the Ludwig Institute for Cancer Research and Austin Health established a state-of-the-art Positron Emission Tomography (PET) Solid Targetry Laboratory at the Austin Hospital. The lab is enabling researchers from the three organisations to pursue vital research into new nuclear imaging techniques to benefit patients affected by different types of cancers.

The partnership provides a reliable and cost effective system for the production of relevant long-lived PET radionuclides suitable for radiolabelling of biomolecules for research and clinical imaging applications.

In addition, the partnership is encouraging knowledge transfer between ANSTO, Ludwig Institute for Cancer Research, Austin Hospital staff, and the Australian scientific community.

This improved training means more patients can benefit from this innovative and highly effective technique to detect cancer.

Macquarie University

An agreement between ANSTO and Macquarie University is helping geologists and scientists better understand everything from where earthquakes might occur to where gold is deposited. The partnership provides joint funding for a senior-level research appointment in the University's Department of Earth and Planetary Sciences.

The appointee is helping lead work to replicate environments located 400 kilometres beneath the earth's surface: specifically a layer called the upper mantle, which is the source of most magma or molten rock beneath the surface.

The study of the physical and chemical processes at these depths will provide a better understanding of the earth, including how mineral deposits are formed. Furthermore, by providing a fuller working model of the processes that occur in the earth's interior, scientists hope to better understand how to predict and anticipate geologic events such as earthquakes and volcanic eruptions.

Monash University

ANSTO's formal agreement with Monash University is helping facilitate knowledge sharing and creating new training and development opportunities for researchers from both organisations. In particular, the common research areas of biomedical imaging, cancer therapy, accelerator science and neutron science are benefiting from the agreement.

One additional area of collaboration is education. Monash University and ANSTO are involved in joint projects such as the annual 'Synchrotron, Accelerator and Neutron New User Symposium' together with other partners.

ANSTO, including the Australian Synchrotron, and Monash took part in a retreat in March to develop medium and long term strategic roadmaps for the collaboration. ANSTO and Monash have also jointly provided seed funding to seven collaborative research projects.

Shanghai Institute for Applied Physics (SINAP)

ANSTO and SINAP signed a research collaboration MoU in December 2012, as part of an ongoing program to recognise and enhance the mutual research links between two of the region's key nuclear science and technology organisations. A significant early result of this collaboration was the announcement, also in December, of the ANSTO-SINAP Joint Materials Research Centre, one of six joint research centres being established under the Australia-China Science and Research Fund.

University of Sydney

ANSTO has a long standing MoU with the University of Sydney which enables scientists from the University of Sydney to undertake research using OPAL and, in return, ANSTO has access to experts and scientific facilities at the University, which rank among the best research institutions in the world. The MoU also ensures that representatives of both organisations meet regularly to consider opportunities for joint research and the sharing of facilities.

One key area of collaboration is between ANSTO and the University's Brain and Mind Research Institute for research and educational purposes. The dedicated medical research cyclotron and radiochemistry facility forms part of the National Imaging Facility (NIF) network.

As well as using current state-of-the-art technology, a key focus for the collaboration is to develop new radiopharmaceuticals, instruments and scientific methods that extend the potential applications of molecular imaging in the future. Molecular imaging plays an important role in unravelling the molecular mechanisms of disease.

Capital investment

ANSTO continued to make significant capital investment in 2012-13. During the financial year some significant new projects commenced and high quality facilities were completed. Some of the key constructions include:

- ANSTO childcare centre – commencing in early in 2013, construction of the centre is progressing well towards its planned opening in August 2013. The provision of the centre supports ANSTO's strategy to reinforce the organisation as an industry leader and increases our ability to attract and retain high calibre staff from Australia and around the globe. The centre has been architecturally designed to fit in with nature and its surrounds including minimising the removal of existing trees on the site. Every effort has been made to ensure the centre is as environmentally friendly as possible including being built with recycled and environmentally sustainable materials, using hydronic heating (water as the heat-transfer medium), solar hot water heating and low energy lighting.
- Neutron Beam Instrument 2 (NBI2) Program – comprises the design, construction and commissioning of three new world class instruments to enhance the research capabilities of the Bragg Institute. These instruments utilise the neutrons provided by the OPAL research reactor. The program has progressed well over 2012-13 and all instruments are on track to be commissioned in the 2013-14 financial year.
- OPAL building extension – will better cater for the needs of the reactor and enable increased radiopharmaceutical production to assist in alleviating the world shortage of molybdenum. The extension includes a two storey office, laboratories and workshops to accommodate many of the nuclear operations staff currently located in other areas across the Lucas Heights site. Construction of this facility is complete and personnel will be transferred into the new facility in the second half of 2013.
- The Centre for Accelerator Science (CAS) Project – will keep ANSTO at the forefront of accelerator mass spectrometry, ion beam analysis and related techniques, by providing two new state of the art linear accelerators as well as the facilities to house them. These accelerators will join ANSTO's existing ANTARES and STAR accelerators. The CAS buildings were completed in the 2012-13 financial year. One of the two accelerators will be delivered in the third quarter of 2013 and the other is forecast to arrive in the second quarter of 2014.

The ANSTO Childcare Centre under construction.

Members of the ANSTO Board touring the completed childcare centre.

PERFORMANCE AGAINST STRATEGIC OBJECTIVES

Key Performance Indicators	2011-12	2012-13
Facility availability		
• Neutron Beam instruments - % days operated per day's beamline availability	**88%**	**67%**
• Planned availability of OPAL - % of actual operating to scheduled operating time	**96%**	**97%**
• Accelerators - average % of days operated per planned operation	**80%**	**77%**
Nuclear Science Facilities project		
• Percentage of capital funding completed	**58.1%**	**95.2%**
Radiopharmaceutical doses		
• Potential Doses	**2,324,663**	**2,420,765**

INDEPENDENT AUDITOR'S REPORT

To the Minister for Innovation, Industry, Science and Research

Report on the Financial Statements

I have audited the accompanying financial statements of the Australian Nuclear Science and Technology Organisation (ANSTO) and its controlled entities for the year ended 30 June 2013, which comprises: the Statement by the Directors, Chief Executive and Chief Financial Officer; the Consolidated Statement of Comprehensive Income; Consolidated Balance Sheet; Consolidated Statement of Changes in Equity; Consolidated Cash Flow Statement; Consolidated Schedule of Commitments not Recognised as Liabilities; Consolidated Schedule of Contingencies; and Notes comprising a Summary of Significant Accounting Policies and other explanatory information of the consolidated entity comprising ANSTO and the entities it controlled at the year's end or from time to time during the financial year.

Directors' Responsibility for the Financial Statements

The directors of ANSTO are responsible for the preparation of the financial statements that give a true and fair view in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997,* including the Australian Accounting Standards, and for such internal control as is necessary to enable the preparation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to ANSTO's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of ANSTO's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial statements.

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19 National Circuit BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Opinion

In my opinion, the financial statements of ANSTO:

(a) have been prepared in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997,* including the Australian Accounting Standards; and

(b) give a true and fair view of the matters required by the Finance Minister's Orders including the consolidated entity's financial position as at 30 June 2013 and of its financial performance and cash flows for the year then ended.

Report on Other Legal and Regulatory Requirements

With the exception of PETNET Australia Pty Ltd, and Synchrotron Light Source Australia Pty Ltd, I have not acted as auditor of, or audited, the financial statements of subsidiaries so identified in note 7D to the financial statements. I have audited the financial information of the subsidiaries that is relevant to the consolidated financial statements of ANSTO.

Australian National Audit Office

Kristian Gage
Audit Principal

Delegate of the Auditor-General

Canberra

15 August 2013

Statement by Directors and Chief Financial Officer

Australian Government

Australian Nuclear Science and Technology Organisation

In our opinion, the attached financial statements for the year ended 30 June 2013 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997 as amended.*

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Australian Nuclear Science and Technology Organisation will be able to pay its debts as and when they become due and payable.

Signed in accordance with a resolution of the Board of Directors.

Paul Greenfield
Chairman
15 August 2013

Shaun Jenkinson
Chief Executive Officer (Acting)
15 August 2013

Peter Arambatzis
Chief Financial Officer
15 August 2013

Consolidated statement of comprehensive income for the year ended 30 June 2013

	Notes	Consolidated 2013 $'000	2012 $'000
EXPENSES			
Employee benefits	6A	**126,447**	114,702
Suppliers expenses	6B	**55,744**	55,670
Depreciation and amortisation	6C	**65,887**	84,073
Write down and impairment of assets	6D	**2,387**	108
Grants	6E	**6,035**	5,021
Finance costs	6F	**14,760**	12,490
Foreign exchange losses	6G	**1,324**	854
Losses from asset sales	6H	**1,410**	91
TOTAL EXPENSES		**273,994**	273,009
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Sale of goods and rendering of services	5B	**60,358**	69,988
Interest	5D	**3,314**	5,040
Grants	5C	**12,881**	1,674
Total own-source revenue		**76,553**	76,702
Gains			
Gains from sale of assets	5E	**22**	172
Foreign exchange gains - non speculative	5F	**2,264**	1,831
Reversal of previous asset write-downs and impairments	5G	**5,000**	-
Other revenue	5H	**685**	79
Total gains		**7,971**	2,082
Total Own-source income		**84,524**	78,784
Net cost of services		**189,470**	194,225
Revenue from Government	5A	**157,605**	157,676
(Deficit) before income tax on continuing operations		**(31,865)**	(36,549)
Income tax (expense) benefit	23	**(270)**	1,200
(Deficit) after income tax on continuing operations		**(32,135)**	(35,349)
(Deficit) after income tax		**(32,135)**	(35,349)
(Deficit) attributable to the Australian Government		**(32,135)**	(35,349)
OTHER COMPREHENSIVE INCOME			
Items that will not be reclassified subsequently to profit or loss			
Changes in asset revaluation reserves	10	**(87)**	129,148
Items that may be reclassified subsequently to profit or loss			
Exchange differences on translation of foreign operations	10	**229**	(144)
Total other comprehensive income (deficit) after income tax		**(31,993)**	93,655
Total comprehensive income (deficit) attributable to the Australian Government		**(31,993)**	93,655

The above statement should be read in conjunction with the accompanying notes

Consolidated balance sheet as at 30 June 2013

	Notes	Consolidated 2013 $'000	Consolidated 2012 $'000
ASSETS			
Financial assets			
Cash and cash equivalents	7A, 21	**3,899**	3,411
Trade and other receivables	7B, 21	**15,334**	15,968
Investments	7C, 21	**103,083**	67,389
Total financial assets		**122,316**	86,768
Non-financial assets			
Land and buildings	8A	**302,631**	281,404
Infrastructure, plant and equipment and major facilities	8B	**760,808**	740,445
Inventories	8C	**21,636**	22,247
Intangibles	8D	**73,485**	20,800
Deferred tax assets	8E	**930**	1,200
Other non-financial assets	8E	**2,692**	2,643
Total non-financial assets		**1,162,182**	1,068,739
Total assets		**1,284,498**	1,155,507
LIABILITIES			
Payables			
Suppliers	9F, 21	**13,860**	14,786
Employees	9G, 21	**6,204**	5,544
Grants	9H, 21	**682**	481
Other	9I,21	**14,501**	1,480
Total payables		**35,247**	22,291
Interest bearing liabilities	9A,21	**-**	52
Other		**-**	52
Total interest bearing liabilities			
Provisions			
Employee provisions	9B	**35,714**	31,373
Decommissioning provision	9C	**286,568**	263,011
NTP Provision	9D	**48,680**	-
Other	9E	**47**	45
Total provisions		**371,009**	294,429
Total liabilities		**406,256**	316,772
Net Assets		**878,242**	838,735
EQUITY			
Contributed equity	10	**560,856**	489,356
Reserves	10	**481,984**	480,341
Retained (deficit)	10	**(164,598)**	(130,962)
Total equity		**878,242**	838,735
Total liabilities and equity		1,284,498	1,155,507

The above statement should be read in conjunction with the accompanying notes

Consolidated statement of cash flows for the year ended 30 June 2013

	Notes	Consolidated 2013 $'000 Inflows (Outflows)	2012 $'000 Inflows (Outflows)
OPERATING ACTIVITIES			
Cash received			
Sales of goods and rendering of services		**92,440**	70,136
Interest		**3,155**	5,376
Receipts from Government		**157,605**	157,676
Total cash received		**253,200**	233,188
Cash used			
Employees		**(123,163)**	(110,149)
Suppliers		**(69,736)**	(71,038)
Total cash used		**(192,899)**	(181,187)
NET CASH FLOWS FROM OPERATING ACTIVITIES	11	**60,301**	52,001
INVESTING ACTIVITIES			
Cash received			
Proceeds from sale of property, plant and equipment		**433**	1,483
Proceeds from investment sales		**435,337**	236,933
Total cash received		**435,770**	238,416
Cash used			
Purchase of property, plant and equipment and intangibles		**(104,772)**	(108,656)
Purchase of investments		**(466,031)**	(189,054)
Total cash used		**(570,803)**	(297,710)
NET CASH USED BY INVESTING ACTIVITIES		**(135,033)**	(59,294)
FINANCING ACTIVITIES			
Cash received			
Appropriation - contributed equity		**71,500**	7,400
Receipts from ASCo closure		**3,706**	-
NET CASH FLOWS FROM FINANCING ACTIVITIES		**75,206**	7,400
NET INCREASE IN CASH HELD		**474**	107
EFFECTS OF EXCHANGE CHANGES ON THE BALANCE OF CASH HELD IN FOREIGN CURRENCIES		**14**	26
Cash and cash equivalents at the beginning of the reporting period		**3,411**	3,278
Cash and cash equivalents at the end of the reporting period		**3,899**	3,411

The above statement should be read in conjunction with the accompanying notes

Consolidated statement of changes in equity for the year ended 30 June 2013

	Consolidated					
	Retained Deficit		Asset Revaluation Reserve		Other Reserves	
	2013 $'000	2012 $'000	**2013 $'000**	2012 $'000	**2013 $'000**	2012 $'000
Opening Balance	**(130,962)**	(95,085)	**468,256**	339,108	**12,085**	11,701
Foreign currency translation	**-**	-	**-**	-	**229**	(144)
Revaluation increment	**-**	-	**(87)**	129,148	**-**	-
Deficit for the period	**(32,135)**	(35,349)	**-**	-	**-**	-
Total comprehensive income	**(32,135)**	(35,349)	**(87)**	129,148	**229**	(144)
Transaction with Owners						
Distributions to owners						
Returns on Capital						
Dividends	**-**	-	**-**	-	**-**	-
Contributions by Owners						
Appropriation (equity injection)	**-**	-	**-**	-	**-**	-
Sub-total Transactions with Owners	**-**	-	**-**	-	**-**	-
Transfers between equity components	**(1,501)**	(528)	**-**	-	**1,501**	528
Closing balance as at 30 June	**(164,598)**	(130,962)	**468,169**	468,256	**13,815**	12,085
Closing balance attributable to Australian Government	**(164,598)**	(130,962)	**468,169**	468,256	**13,815**	12,085

The above statement should be read in conjunction with the accompanying notes

AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
CONSOLIDATED STATEMENT of CHANGES in EQUITY
for the year ended 30 June 2013

	Consolidated			
	Contributed Equity/Capital		Total Equity	
	2013 $'000	2012 $'000	**2013 $'000**	2012 $'000
Opening Balance	**489,356**	481,956	**838,735**	737,680
Foreign currency translation	**-**	-	**229**	(144)
Revaluation increment	**-**	-	**(87)**	129,148
Deficit for the period	**-**	-	**(32,135)**	(35,349)
Total comprehensive income	**-**	-	**(31,993)**	93,655
Transaction with Owners				
Distributions to owners				
Returns on Capital				
Dividends	**-**	-	**-**	-
Contributions by Owners				
Appropriation (equity injection)	**71,500**	7,400	**71,500**	7,400
Sub-total Transactions with Owners	**71,500**	7,400	**71,500**	7,400
Transfers between equity components	**-**	-	**-**	-
Closing balance as at 30 June	**560,856**	489,356	**878,242**	838,735
Closing balance attributable to Australian Government	**560,856**	489,356	**878,242**	838,735

The above statement should be read in conjunction with the accompanying notes

Consolidated schedule of commitments not recognised as liabilities as at 30 June 2013

	Notes	Consolidated 2013 $'000	2012 $'000
BY TYPE			
Commitments receivable			
Other commitments receivable			
GST recoverable from Australian Taxation Office on Commitments		**4,226**	7,972
Total other commitments receivable		**4,226**	7,972
Commitments payables			
CAPITAL COMMITMENTS			
Infrastructure, plant and equipment		**31,378**	71,972
Total capital commitments		**31,378**	71,972
OTHER COMMITMENTS			
Replacement Research Reactor Project (OPAL)	(a)	**371**	3,093
Operating lease	(b)	**1,747**	1,725
Fuel elements purchase		**9,783**	9,693
Mo-99 plates purchase		**3,209**	6,024
Total other commitments		**15,110**	20,535
Net commitments by type		**42,262**	84,535
BY MATURITY			
Capital commitments payable			
One year or less		**5,631**	8,581
From one to five years		**25,747**	63,391
		31,378	71,972
OTHER COMMITMENTS			
One year or less		**3,875**	12,022
From one to five years		**4,598**	7,610
Over five years		**6,637**	903
Total other commitments		**15,110**	20,535
Other commitments receivable			
One year or less		**1,885**	2,209
From one to five years		**2,341**	5,763
		4,226	7,972
Net commitments by maturity		**42,262**	84,535

(a) A contract was executed on 13 July 2000 between ANSTO and INVAP SE for the design, construction and commissioning of a replacement research reactor at Lucas Heights. The remaining amount of $0.371 million (2012: $3.093 million) is included in commitments.

(b) ANSTO has a twenty five year lease contract with Central Sydney Area Health Services that will expire on 29 Jan 2025 with an annual rental payable of $137,000 (2012: $137,000).The annual rental is subject to review every three years.

The amounts reported as commitments payable includes GST where relevant. Recoveries due from the Australian Taxation Office in relation to commitments payable are disclosed as commitments receivable.

The above statement should be read in conjunction with the accompanying notes

Schedule of contingencies as at 30 June 2013

Unquantifiable Contingencies

At 30 June 2013, ANSTO still has the likelihood of claims in relation to asbestos related diseases. It is not possible to estimate the amounts of any eventual payments that may be required in relation to these claims. Such claims are however covered by the Department of Finance and Deregulation provision dealing with asbestos related claims against any Commonwealth Authorities including ANSTO in the event of any litigation or claim for compensation.

Contingent Liabilities

On 25 June 2012, Cyclopharm Limited's wholly owned subsidiary, CycloPet Pty Ltd., commenced proceedings against ANSTO and PETNET Australia Pty Ltd, the wholly owned subsidiary of ANSTO in the Federal Court of Australia alleging anticompetitive conduct.

ANSTO and PETNET Australia Pty Ltd will strongly defend the case and will manage any litigation claim exposure under the Professional Indemnity section of the 2012-13 Comcover policy.

The above schedule should be read in conjunction with the accompanying notes.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

Note	Description
1	Objectives of the entity
2	Summary of significant accounting policies
3	Events subsequent to reporting date
4	Reporting of outcomes
5	Revenue
6	Expenses
7	Financial assets
8	Non-financial assets
9	Liabilities
10	Equity
11	Cash flow reconciliation
12	Government funding
13	Board membership
14	Remuneration of members of the Board
15	Remuneration of senior executives
16	OPAL Nuclear Research Reactor
17	Insurances
18	Remuneration of auditors
19	Related party disclosures
20	Trust money
21	Financial instruments
22	Operating lease arrangements
23	Income tax expense (benefit)
24	Other comprehensive income
25	Information relating to ANSTO ('the parent entity")
26	Transfer of financial balances from ASCo closure

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

1 Objectives of Australian Nuclear Science and Technology Organisation

Australian Nuclear Science and Technology Organisation (ANSTO) is an Australian Government controlled entity. The objectives of ANSTO are detailed in the body of this Annual Report.

ANSTO has only one outcome as reflected in the 2012-13 Portfolio Budget Statement as indicated below:

Outcome 1: Improved knowledge, innovative capacity and healthcare through nuclear-based facilities, research, training, products, services and advice to Government, industry, the education sector and the Australian population.

ANSTO's activities contributing towards the outcome are classified as departmental. Departmental activities involve the use of assets, liabilities, revenues and expenses controlled or incurred by ANSTO in its own right. Administered activities involve the management or oversight by ANSTO, on behalf of the Government, of items controlled by the Government. ANSTO does not have any administered activities.

The continued existence and operations of the Australian Nuclear Science and Technology Organisation (ANSTO) and its present programs is dependent on Government policy and on continuing funding by the Commonwealth Government for ANSTO's administration and programs.

Reference to ANSTO, means ANSTO and its controlled entities ('ANSTO Consolidated') except for under taxation note 2(s).

2 Summary of significant accounting policies

(a) Basis of preparation of the Financial Statements

The financial statements and notes are required by clause 1(b) of Schedule 1 to the *Commonwealth Authorities and Companies Act 1997 (CAC Act)* and are general purpose financial statements.

They have been prepared:

i. having regard to the provisions of the Australian Nuclear Science and Technology Organisation *(ANSTO)* Act 1987 *(as amended)*
ii. in accordance with:
. Finance Minister's Orders (FMOs) for reporting periods ending on or after 1 July 2012; and
. Australian Accounting Standards and Interpretations issued by the Australian Accounting Standard Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accruals basis and in accordance with the historical cost convention, except for certain assets which are stated at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial report is presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Unless an alternative treatment is specifically required by an Accounting Standard or the FMOs, assets and liabilities are recognised in the Balance Sheet when and only when it is probable that future economic benefits will flow to ANSTO or a future sacrifice of economic benefits will be required and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under executory contracts are not recognised unless required by an Accounting Standard. Liabilities and assets that are unrecognised are reported in the Schedule of Commitments or the Schedule of Contingencies.

Unless alternative treatment is specifically required by an Accounting Standard, income and expenses are recognised in the Statement of Comprehensive Income when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

(b) Significant Accounting Judgements and Estimates

In the process of applying the accounting policies listed in this note, ANSTO has made the following judgements that have the most significant impact on the amounts recorded in the financial statements.

- The fair value of land and buildings.
- The fair value of OPAL and other plant and equipment and their useful life.
- Decommissioning costs provision.
- Valuation of the intangible asset relating to intellectual property and valuation of associated liability.

Apart from these assumptions and estimates no other accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

(c) Statement of Compliance

Australian Accounting Standards require a statement of compliance with International Financial Reporting Standards (IFRSs) to be made where the financial report complies with these standards. Some Australian equivalents to IFRSs and other Australian Accounting Standards contain requirements specific to not-for-profit entities that are inconsistent with IFRS requirements. ANSTO is a not-for-profit entity and has applied these requirements, so while this financial report complies with Australian Accounting Standards including Australian Equivalents to International Financial Reporting Standards (AEIFRSs) it does not comply with IFRS in all respects

(d) Adoption of new Australian Accounting Standard requirements

No accounting standard has been adopted earlier than the application date as stated in the standard.

No new standards/revised standards/Interpretations or amending standards were issued prior to the signing of the statement by the directors and chief financial officer, which were applicable to the current reporting period and had a financial impact on ANSTO.

Other new standards/revised standards/Interpretations or amending standards that were issued prior to the signing of the statement by the directors and chief financial officer and are applicable to the current reporting period did not have a financial impact, and are not expected to have a future financial impact on ANSTO.

Future Australian Accounting Standard Requirements

No new standards/revised standards/Interpretations or amending standards were issued by the Australian Accounting Standards Board prior to the signing of the statement by the directors and chief financial officer, which are expected to have a financial impact on ANSTO for future reporting periods.

Other new standards/revised standards/Interpretations or amending standards that were issued prior to the signing of the statement by the directors and chief financial officer and are applicable to the future reporting period are not expected to have a future financial impact on ANSTO.

(e) Reporting by outcomes

A comparison of current and prior years' figures by outcome as specified in the Portfolio Budget Statements relevant to ANSTO, is presented in Note 4.

(f) Revenue recognition

Revenue from Government
Funding received or receivable from the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) (appropriated to ANSTO as a CAC Act body) is recognised as Revenue from Government unless it is in the nature of an equity injection.

Equity injections
Amounts that are designated as equity injections for a year are recognised directly in contributed equity in that year.

Operating revenue from goods and services
Revenue from the sale of goods is recognised when:
- The risks and rewards of ownership have been transferred to the buyer;
- ANSTO retains no managerial involvement nor effective control over the goods;
- The revenue and transaction costs incurred can be reliably measured; and
- It is probable that the economic benefits associated with the transaction will flow to ANSTO

Receivables for goods and services are recognised at the nominal amounts due less any impairment allowance. Collectability of debts is reviewed at balance date. Allowance is made when collectability of the debt is no longer probable.

Revenue received in advance
Revenue received in advance is initially brought to account as "unearned revenue" and subsequently recognised as revenue when earned.

Contract revenue
Revenue from the rendering of a service is recognised by reference to the stage of completion of each contract. The stage of completion is determined by reference to the proportion that the completed physical contract work bears to the estimated total physical contract work.

Interest revenue
Interest revenue is recognised using the effective interest method as set out in AASB 139 Financial Instruments Recognition and Measurement.

Gains from sale of assets
Revenue is recognised when control of the asset has passed to the buyer.

Core operations
All material revenues described in this note are revenues relating to the core operating activities of ANSTO.
Details of revenue amounts are given in Note 5.

Resources Received Free of Charge
Resources received free of charge are recognised as revenue when and only when a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature i.e. whether they have been generated in the course of the ordinary activities of ANSTO.

Parental Leave Payments Scheme
Amounts received under the Parental Leave Payments Scheme not yet paid to employees are presented gross as cash and a liability (payable). Amounts received and not paid at 30 June 2013 amounted to $7,769 (2012: $10,759).

(g) Employee benefits

Benefits
Liabilities for services rendered by employees are recognised at the reporting date to the extent that they have not been settled

Liabilities for wages and salaries and annual leave are measured at their nominal amounts. Other employees benefits expected to be settled within 12 months of their reporting date are also measured at their nominal amounts.

The provision for employee entitlements encompasses annual leave and long service leave that ANSTO has a present obligation to pay resulting from employee services provided up to balance date. The leave liabilities are calculated on the basis of employees' remuneration, including employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

ANSTO has used the Department of Finance and Deregulation shorthand method in valuation of the liability for long service leave. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

General leave
The Enterprise Agreement provides under the heading General Leave for an employee entitlement which combines sick leave, carer's leave and leave for other prescribed purposes. No provision has been made for general leave as all such leave is non-vesting and the average general leave taken by employees is less than the annual entitlement.

Separation and redundancy
Provision is made for separation and redundancy benefits payments. ANSTO recognises a provision for termination when it has developed a detailed formal plan for the termination and has informed those employees affected that it will carry out the termination. The total provision in the financial statements for 3 staff (2012: 1) amounted to $323,000 (2012: $25,000).

(h) Superannuation

ANSTO contributes to the Commonwealth Superannuation (CSS) and the Public Sector (PSS) superannuation schemes or PSS accumulation plan (PSSap) which provide retirement, death and disability benefits to employees.

The CSS and PSS are defined benefit schemes for the Commonwealth while the PSSap is a defined contribution scheme. Contributions to the schemes are at rates calculated to cover existing and emerging obligations. Applicable contribution rates in 2013 were 17.3% (2012 17.8%) of salary (PSS), 19.2% (2012 16.9%) of salary (CSS), and 15.4% (2012 15.4%) of salary (PSSap). An additional 3% is contributed to PSS and CSS for employer productivity benefits. The Enterprise Agreement signed in March 2012 provided that all ANSTO employees under the agreement who contributed to non Commonwealth superannuation schemes, are to receive a contribution equivalent to 15.4% of salary. For those staff who do not contribute to any of these schemes and are not covered by Enterprise Agreement, ANSTO contributes an amount equivalent to 9% of salary to the Australian Government Employees Superannuation Trust fund or to the complying fund nominated by the employee.

ANSTO makes employer contributions to the employees' superannuation scheme at rates determined by actuary to be sufficient to meet the current cost to the Government. ANSTO accounts for contributions as if they are contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the year. Contributions during the year are detailed in Note 6A.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

(i) Leases

Operating leases payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

(j) Cash

Cash is recognised at its nominal amount. Cash and cash equivalents includes:
• cash on hand;
• demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value

(k) Financial instruments

ANSTO classifies its financial assets in the following categories:
• 'financial assets as at fair value through profit or loss'
• 'held-to-maturity investments',
• 'loans and receivables'.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition.

Financial assets are recognised and derecognised upon 'trade date'.

Effective interest method
The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that discounts estimated future cash receipts through the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets 'at fair value through profit or loss'.

Financial assets at fair value through profit or loss
Financial assets are classified as financial assets at fair value through profit or loss where the financial assets have been acquired principally for the purpose of selling in the near future. Assets in this category are classified as current assets.

Financial assets at fair value through profit or loss are stated at fair value, with any resultant gain or loss recognised in the profit or loss. The net gain or loss recognised in the profit or loss incorporates any interest earned on the financial assets.

Where a reliable fair value cannot be established for unlisted investments in equity instruments, cost is used less impairment if applicable.

Held-to-maturity investments
Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are recorded at amortised cost using the effective interest method less impairment, with revenue recognised on an effective yield basis.

Loans and receivables
Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

Impairment of financial assets
Financial assets are assessed for impairment at each balance date.

• Financial assets held at amortised cost - If there is objective evidence that an impairment loss has been incurred for loans and receivables or held to maturity investments held at amortised cost, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the statement of comprehensive income.

• Available for sale financial assets (held at cost) - If there is objective evidence that an impairment loss has been incurred the amount of the impairment loss is the difference between the carrying amount of the asset and the present value of the estimated future cash flows discounted at the current market rate for similar assets.

Financial Liabilities
Financial liabilities are classified as either financial liabilities 'at fair value through profit or loss' or other financial liabilities.

Financial liabilities are recognised and derecognised upon 'trade date'.

Other financial liabilities
Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective yield basis.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period.

Supplier and other payables
Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

(l) Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the balance sheet but are reported in the relevant schedules and notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

(m) Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and revenues at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

(n) Buildings, infrastructure, plant and equipment and major facilities

Asset recognition threshold
Items of buildings, infrastructure, plant and equipment and major facilities are recorded at cost of acquisition and depreciated as outlined below. Items of plant and equipment with a cost of less than $3,000 are expensed in the year of acquisition.

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located at the end of its useful life. This is particularly relevant to 'make good' or decommissioning provisions on buildings, infrastructure, plant and equipment and major facilities, taken up by ANSTO where there exists an obligation to restore the property to its original condition. These costs are included in the value of the asset it relates to with a corresponding provision for the 'make good' or decommissioning taken up.

Any changes to the initial decommissioning cost attributable to adjustments to the consumer price index (cpi) and discount rate at 30 June each year will be reflected as an adjustment to the Provision for Decommissioning cost and Asset Revaluation Reserve in accordance with the Department of Finance and Deregulation Accounting Guidance Note.

The cost of assets constructed by the entity includes the cost of materials, direct labour and an appropriate proportion of fixed and variable overheads.

Revaluations
Fair values for each class of asset are determined as shown below:

Asset Class	Fair value measured at
Land	Market Value
Building	Market Value
Site infrastructure	Market Value
Electrical infrastructure	Market Value
Plant and equipment	Market Value
National and major facilities	Market Value

Following initial recognition at cost, buildings, infrastructure, plant and equipment and major facilities are carried at fair value less accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised through profit and loss. Revaluation decrements for a class of assets are recognised directly through profit and loss except to the extent that they reverse a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount except for assets relating to decommissioning that are not subjected to revaluation.

All valuation are carried out by qualified parties, independent of ANSTO. The valuations were performed by independent valuers of the Australian Valuation Officers (AVO), Mr. Simon O'Leary (registered Valuer No. 1128), Mr. Christofer Fratzia (registered Valuer No. 3794) and Mr. Kashyap Budhbhatti at 30 June 2012, based on the asset list at 31 October 2011.

Depreciation and amortisation
Items of buildings, infrastructure, plant and equipment and major facilities, but excluding freehold land, are depreciated over their estimated useful lives to ANSTO using the straight line method.

Depreciation and amortisation rates applying to each class of depreciable asset are based on the following useful lives:

	2013	2012
Buildings on freehold land	**5 to 50 years**	5 to 50 years
Plant and equipment	**2 to 30 years**	2 to 30 years
Infrastructure	**20 years**	20 years
National and major facilities	**5 to 40 years**	5 to 40 years

The depreciation rates (useful lives) of ANSTO's buildings, infrastructure, plant and equipment and major facilities have been reviewed during the year and found to be appropriate.

The aggregate amount of depreciation allocated for each class of asset during the reporting period is disclosed in Note 6C.

Recoverable amount test
Those assets carried at cost (less accumulated depreciation) are reviewed to determine whether this is in excess of the recoverable amount. If an excess exists as at the reporting date, the asset is written down to its recoverable amount. In assessing recoverable amounts, the relevant cashflows have been discounted to their present value.

Impairment
All assets were assessed for impairment at 30 June 2013. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cashflows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the entity were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

(o) Inventories

Stores are valued at purchase cost on a first-in-first-out basis. Provision is made for obsolete inventory and diminution in value.

Inventories of Cobalt-60 and enriched uranium are valued on the basis of lower of cost and net realisable value.

Stocks of reactor fuel are valued at average purchase price.

Heavy water is valued at lower of cost and net realisable value.

Finished goods and work in progress are valued at cost of direct materials and labour plus attributable costs that are capable of being allocated on a reasonable basis.

(p) Intangibles

Software
Items of software are recorded at cost and amortised as outlined below. Items with a cost of less than $3,000 are expensed in the year of acquisition.

There is no material internal software development.

Software and licences are reported at cost.

Intellectual property

ANSTO and NTP (the Parties) signed a Heads of Agreement in March 2010 with a view to entering into future Agreements for the provision of NTP's IP to ANSTO to enable ANSTO to building a new Mo-99 processing plant at Lucas Heights.

Under the terms of the IP Agreement NTP grant to ANSTO an exclusive, irrevocable, perpetual licence to use, exploit, reproduce and modify the current IP and the future IP. The IP includes copyright designs, patents, know-how and trade secrets and confidential information owned by NTP and used in its own production plant. It includes the provision of all IP to assist ANSTO in the design, construction and operation of a large scale Mo-99 plant.

The IP Agreement makes provision for ANSTO to pay the sum of US$60M (capped) to NTP for the IP. The payment's will continue at 22.5% of the sales volume up to the date of the commissioning and operation of the new Mo-99 Plant at which time the percentage will decrease to 15% until full payment of the US$60M. The payment will include any sums paid under the initial Commercial Agreement relating to IP to enhance the current production facility.

ANSTO intends to recognise this IP as an intangible asset with an indefinite life in relation to the IP rights conveyed, at estimated net present value of $48.7 million and a financial liability for the future payments required in relation to the asset. This $48.7 million has been derived from calculating the estimated commission to be paid to NTP based on expected future sales and then discounted back at 5.5% to arrive at 30 June 2013 dollars.

Intellectual property treated as intangible assets and acquired separately is measured on initial recognition at cost.

The useful lives of intangible assets are assessed as either finite or indefinite.

Intangible assets with finite lives are amortised over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired.

Intangible assets with indefinite useful lives are not amortised, but are tested for impairment annually, either individually or at the cash-generating unit level.

Amortisation

Intangibles are amortised over their estimated useful lives to ANSTO using the straight line method.

Amortisation rates applying to intangibles are as follows:

	2013	2012
Purchased software	2 - 7 years	2 - 7 years
Licences	**3 years**	3 years
Intellectual property	indefinite	-

The amortisation rates (useful lives) of ANSTO's software and licences have been reviewed during the year and found to be appropriate.

No amortisation is applied to Intellectual Property as this is assessed as having an indefinite useful life.

The aggregate amount of amortisation allocated for each class of asset during the reporting period is disclosed in Note 6C.

Impairment

All assets were assessed for impairment at 30 June 2013. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

(q) Patents

Due to the uncertain commercial value of patents, trademarks, designs and applications, and because benefits extending beyond one accounting period cannot be assured, the costs associated with the development and registration of patents are expensed in the year in which they are incurred, unless recoverability is assured beyond any reasonable doubt. At 30 June 2013 there were 142 patents, trademarks, design and applications (208 at 30 June 2012) registered to ANSTO and no associated costs are recognised as an asset (nil at 30 June 2012).

(r) Foreign currency

Transactions denominated in a foreign currency are converted to Australian currency at the rate of exchange prevailing at the date of the transaction. At balance date, amounts receivable and payable in foreign currency are translated to Australian currency at the exchange rate prevailing at that date and any exchange differences are brought to account in the Statement of Comprehensive Income. ANSTO did not enter into speculative forward exchange contracts during the reporting period.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

(s) Taxation

ANSTO is exempt from all forms of taxation in Australia except fringe benefits tax (FBT) and the goods and services tax (GST).
ANSTO is not subject to exemption from any foreign taxation laws relative to its overseas operations.
ANSTO's subsidiaries are subject to normal taxation except for Synchrotron Light Source Australia Pty Ltd which is a tax exempt entity being charity institution.

ANSTO Inc. a USA company, is subject to US tax laws. No Deferred Tax Asset has been recognised at 30 June 2013 in relation to ANSTO Inc. as the directors do not believe it is probable that sufficient profits will be generated to utilise the tax losses.

Revenues, expenses and assets are recognised net of GST except:
- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivable and payables.

Subsidiaries
Unbooked deferred tax assets in relation to unrecouped tax losses including timing difference in the subsidiaries is $32 thousand (2012: $52 thousand).
The total deferred tax assets recognised in relation to PETNET Australia Pty Ltd for 30 June 2013 is $766 thousand (2012: $1,200 thousand).

In respect of the subsidiaries, current tax assets and liabilities for the current and prior periods are measured at the amount expected to be recovered from or paid to the taxation authorities based on the current period's taxable income. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted by the balance sheet date.

Deferred income tax is provided on all temporary differences at the balance sheet date between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes.

Deferred income tax liabilities are recognised for all taxable temporary differences except:
- when the deferred income tax liability arises from the initial recognition of goodwill or of an asset or liability in a transaction that is not a business combination and that, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; or
- when the taxable temporary difference is associated with investments in subsidiaries, associates or interests in joint ventures, and the timing of the reversal of the temporary difference can be controlled and it is probable that the temporary difference will not reverse in the foreseeable future.

Deferred income tax assets are recognised for all deductible temporary differences, carry forward of unused tax credits and unused tax losses, to the extent that it is probable that taxable profit will be available against which the deductible temporary differences and the carry forward of unused tax credits and unused tax losses can be utilised, except:
- when the deferred income tax asset relating to the deductible temporary difference arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; or
- when the deductible temporary difference is associated with investments in subsidiaries, associates or interests in joint ventures, in which case a deferred tax asset is only recognised to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilised.

Unrecognised deferred income tax assets are reassessed at each balance sheet date and are recognised to the extent that it has become probable that future taxable profit will allow the deferred tax asset to be recovered.
Deferred income tax assets and liabilities are measured at the tax rates that are expected to apply to the year when the asset is realised or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the balance sheet date.

Deferred tax assets and deferred tax liabilities are offset only if a legally enforceable right exists to set off current tax assets against current tax liabilities and the deferred tax assets and liabilities relate to the same taxable entity and the same taxation authority.

(t) Principles of consolidation

ANSTO has investments in a number of companies (refer Note 7D) over which it has control. These companies have been established for the purpose of (i) commercialisation of ANSTO's intellectual property, (ii) a requirement for ANSTO to operate in the industry as in the case of ANSTO Inc., an operation in the U.S.A. or (iii) a requirement for ANSTO to operate in another science industry as in the case Synchrotron Light Source Australia Pty Ltd.

(u) Interest in joint venture

A joint venture is a contractual arrangement whereby ANSTO and the other parties undertake an economic activity that is subject to joint control (i.e. when the strategic financial and operating policy decisions relating to the activities of the joint venture require the unanimous consent of the parties sharing control).

ANSTO has an investment in Element 42 LLC (refer Note 7E) over which it has shared control.

(v) Comparatives

Where necessary, comparative information for the preceding financial year has been reclassified to achieve consistency in disclosure with current financial year amounts and other disclosures.

(w) Rounding

Amounts are rounded to the nearest one thousand dollars except in relation to:
- remuneration of members of the Board
- remuneration of executives
- audit fees

3 Events subsequent to reporting date

No events have arisen since the end of the financial year which require disclosure or the financial statements to be adjusted.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

4 Reporting of Outcomes

ANSTO operates mainly within Australia, and mainly in the nuclear scientific research industry.
Reporting by outcomes:

ANSTO has only one outcome.

Major Classes of Departmental Revenues and Expenses by Outcome - Consolidated

	Consolidated	
	2013	2012
	$'000	$'000
Operating revenues		
Revenue from Government	**157,605**	157,676
Sale of goods and services	**60,358**	69,988
Interest	**3,314**	5,040
Gain from sale of assets	**22**	172
Reversal of previous impairments	**5,000**	-
Other	**15,830**	3,584
Income tax benefits	**-**	1,200
Total operating revenues	**242,129**	237,660
Operating expenses		
Employees	**126,447**	114,702
Suppliers	**55,744**	55,670
Depreciation and amortisation	**65,887**	84,073
Finance costs	**14,760**	12,490
Write-down and impairment of assets	**2,387**	108
Other	**8,769**	5,966
Total operating expenses	**273,994**	273,009

Major Classes of Departmental Assets and Liabilities by Outcome - Consolidated

	Consolidated	
	2013	2012
	$'000	$'000
Assets		
Cash and cash equivalents	**3,899**	3,411
Trade and other receivables	**15,334**	15,968
Investments	**103,083**	67,389
Land and buildings	**302,631**	281,404
Infrastructure, plant and equipment	**760,808**	740,445
Inventories	**21,636**	22,247
Intangibles	**73,485**	20,800
Tax assets	**930**	1,200
Other	**2,692**	2,643
Total assets	**1,284,498**	1,155,507
Suppliers	**13,860**	14,786
Employees payables	**6,204**	5,544
Grants	**682**	481
Other payables	**14,501**	1,480
Interest bearing liabilities	**-**	52
Employee provisions	**35,714**	31,373
Decommissioning provision	**286,568**	263,011
Other provisions	**48,727**	45
Total liabilities	**406,256**	316,772

Notes:

The net costs include intra - government costs that would be eliminated in calculating the actual Budget outcome.

	Notes	Consolidated 2013 $'000	2012 $'000
5 Revenue			
5A. Revenue from Government			
CAC Act payments from DIICCSRTE		**157,605**	157,676
5B. Sale of goods and rendering of services			
Radioisotope sales		**29,378**	27,876
Services and contract research		**20,725**	30,668
Silicon irradiation		**3,703**	5,193
CSIRO site support		**1,092**	1,210
Training courses		**374**	260
Land management		**3,462**	3,422
AINSE interactions		**1,624**	1,359
Total sales of goods and rendering of services		**60,358**	69,988
5C. Grants		**12,881**	1,674
5D. Interest - Bank		**3,314**	5,040
5E. Gains from sale of assets			
Proceeds from sale of assets		**215**	687
Carrying value of assets sold		**(193)**	(515)
Gain from disposal of infrastructure, plant and equipment		**22**	172
5F. Foreign exchange gains - non speculative		**2,264**	1,831
5G. Reversals of Previous Assets Write-downs and Impairments			
Reversal of Impairment Losses		**5,000**	-
5H. Other revenue:			
Gain from inventory revaluation		**-**	79
Asset free of charges		**685**	-
Total other revenue		**685**	79
Total own-source revenue		**84,524**	78,784
Total revenues from ordinary activities		**242,129**	236,460
5I. Sales of goods and rendering of services			
Goods		**29,378**	27,876
Services		**30,980**	42,112
Total sales of goods and rendering of services	5B	**60,358**	69,988
Provision of goods to:			
Related entities		**-**	-
External entities		**29,378**	27,876
Total sales of goods		**29,378**	27,876
Rendering of services to:			
Related entities		**2,138**	1,822
External entities		**28,842**	40,290
Total rendering of services		**30,980**	42,112

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

	Notes	Consolidated 2013 $'000	2012 $'000
6 Expenses			
The breakdown of operating expenses is:			
6A. Employee benefits:			
Wages and salaries		**95,461**	86,628
Superannuation		**18,263**	16,111
Leave and other entitlements		**12,091**	11,947
Separation and redundancy		**632**	16
Total employee benefits		**126,447**	114,702
6B. Supplier expenses:			
Goods from related entities		**-**	-
Goods from external entities		**3,978**	33,501
Services from related entities		**27,317**	25,895
Workers compensation premiums - related		**731**	806
Services from external entities		**23,712**	(4,532)
Operating lease rentals - external		**6**	-
Total supplier expenses		**55,744**	55,670
6C. Depreciation and amortisation			
Depreciation of property, plant and equipment (a)	8B	**61,815**	77,327
Impairment of property, plant and equipment (a)	8B	**415**	-
Amortisation of intangible assets - licence	8D	**556**	72
Amortisation of intangible assets - design fees	8D	**367**	280
Amortisation of intangible assets - software	8D	**2,734**	6,394
Total depreciation and amortisation		**65,887**	84,073
6D. Write-down and impairment of assets			
Financial assets:			
Receivables for goods and services		**1,992**	108
Non financial assets:			
Materials - write off obsolete stock		**47**	-
Fixed assets write-down		**348**	-
Total write-down of assets		**2,387**	108
6E. Grants		**6,035**	5,021
6F. Finance costs			
Unwinding of discount on decommissioning costs		**14,760**	12,298
Interest		**-**	192
		14,760	12,490
6G. Foreign exchange losses			
Foreign exchange loss - non speculative			
-realised		**490**	765
-unrealised		**834**	89
		1,324	854
6H. Losses from asset sales			
Proceeds from sale of assets		**218**	796
Carrying values of assets sold		**(1,628)**	(887)
Total losses from asset sales		**1,410**	91

(a) Depreciation and impairment of property, plant and equipment:
The aggregate amounts of depreciation expensed and impairment during the reporting period for each depreciable class of property, plant and equipment are as follows:

Buildings on freehold land	**10,306**	1,428
Plant and equipment	**22,051**	47,811
Infrastructure	**3,299**	2,645
National and major facilities	**26,159**	25,443
	61,815	77,327
Add: Impairment	**415**	-
Total depreciation and amortisation	**62,230**	77,327

		Consolidated	
		2013	2012
		$'000	$'000
7 Financial assets			
7A. Cash and cash equivalents			
Cash on hand or on deposit		**3,899**	3,411
Total cash and cash equivalents		**3,899**	3,411
7B. Trade and other receivables			
Goods and services			
Goods and services - related entities		**592**	258
Goods and services - external parties		**12,606**	14,101
Total receivables for goods and services		**13,198**	14,359
Other receivables			
Interest accrued		**451**	292
Other		**3,027**	848
GST receivable from the Australian Taxation Office		**666**	577
Total other receivables		**4,144**	1,717
Less impairment allowance account:			
Goods and services		**2,008**	108
Total impairment allowance	(b)	**2,008**	108
Total trade and other receivables (net)	(a)	**15,334**	15,968
Receivable are expected to be recovered in:			
No more than 12 months		**13,702**	14,336
More than 12 months		**1,632**	1,632
Total trade and other receivable (net)		**15,334**	15,968

(a) Total receivables are aged as follows:

Age analysis of trade and other receivables (net)		
Current	**9,454**	7,881
Overdue:		
Less than 30 days	**2,429**	2,739
30 to 60 days; and	**1,161**	196
60 to 90 days	**586**	-
More than 90 days	**1,704**	5,152
Total receivables (gross)	**15,334**	15,968

(b) The provision for doubtful debts represents certain debts aged more than 90 days (2012: aged more than 90 days).

The Impairment allowance is aged as follows:		
Age analysis of trade debtors		
More than 90 days	**2,008**	108
Total impairment allowance account	**2,008**	108

Reconciliation of the Impairment Allowance Account:

Opening Balance	**108**	3
Amount provided	**1,992**	108
Amount recovered and reversed	**(92)**	(3)
Closing Balance	**2,008**	108

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

		Consolidated	
		2013	2012
		$'000	$'000
7C. Investments			
Bank bills		**80,972**	58,500
Term deposit		**17,111**	8,889
Investment in Australian Synchrotron	(a)	**5,000**	-
Investment in ANSTO Inc.		**-**	-
Investment in PETNET Australia Pty Limited		**-**	-
Investment in Synchrotron Light Source Australia		**-**	-
Total investments		**103,083**	67,389

(a) Last year the investment in Australian Synchrotron Holding Company of $5M was assessed as requiring impairment testing and due to the uncertainty regarding future funding, the decision was taken that the investment be fully impaired. A reassessment of this investment is required this year. Due to the changed circumstances resulting in the securing of future funding and ANSTO being chosen as preferred operator from 1 January 2013, Management has determined to fully reverse the impairment this year.

7D. Investment in subsidiaries

The details of the subsidiaries of ANSTO are:

Name	**Place of Incorporation**	**% Owned**	**Investment**	
			2013 $	2012 $
ACN 120 875 498 Pty Limited (formerly Australian Membrane Technologies Pty Limited)	**Australia**	100%	1	1
PETNET Australia Pty Ltd	**Australia**	100%	10,957,588	14,457,588
Synchrotron Light Source Australia Pty Ltd	**Australia**	100%	1	-
ANSTO Inc.	Delaware U.S.A.	100%	-	-
			10,957,590	14,457,589

ANSTO Inc. was incorporated in Delaware, USA on 27 October 1999. At 30 June 2013: US$100 (2012: US$100). of capital has been invested in this wholly owned subsidiary. This investment has been written off in prior periods.

In November 2004, the Board decided to utilise ANSTO Inc to promote the commercialisation of ANSTO Technology in the USA.

ANSTO, Inc. has acquired its indebtedness from Australian Nuclear Science and Technology Organisation (ANSTO) as a contribution to capital. ANSTO Inc. having satisfied the indebtedness with an amount of money equal to the ANSTO's adjusted basis in the indebtedness represented as US$ 1,870 thousand principal loan and US$510 thousand Interest accrued totalling US$ 2,380 thousand debt which is to be converted to equity as additional paid in capital.

ANSTO assessed the carrying value of the ANSTO investment in PETNET, including a review of the cash flow projections. The resulting PETNET valuation based on a discount rate of 14.20% (2012, 14.16%) and 13 years (2012,14 years) cash flow plus the value of cash on hand (surplus asset) was $13,719 thousand (2012, $14,458 thousand) compared to a carrying value of the investment of $14,458 thousand (2012, $13,628), giving a down up of $739 thousand (2012, impairment of $830 thousand).

In March 2012, the Australian and Victorian Governments had secured future of the Australian Synchrotron through a $100 million, four- year funding arrangement. Following that announcement, ANSTO on 26 October 2012 has been appointed as the operator of the Australian Synchrotron effective from 1 January 2013. Synchrotron Light Source Australia Pty Ltd (SLSA) a wholly-owned subsidiary of ANSTO was incorporated on 14 August 2012 as the company that replaced the previous operator of the Australian Synchrotron.

For the financial year ended 30 June 2013 the financial statements of ANSTO Inc. were audited by Galusha, Higgings & Galusha, P.C. and there were no requirements for financial statements to be prepared or audited for ACN 120 875 498 Pty Limited (previously Australian Membrane Technologies Pty Limited) as it is a dormant company.

7E. Investment in joint venture

Name	**Place of Incorporation**	**% Owned**
Element 42 LLC	Delaware U.S.A.	50%

Element 42 LLC. was incorporated in Delaware, USA on 1 June 2010. At 30 June 2013 ANSTO's investment was carrying value of investment: US$600 (2012: US$400). Element 42 LLC has not traded.

7F. Investment - other

Name	Place of Incorporation	% Owned	Investment 2013 $	Investment 2012 $
Clarity Pharmaceuticals Pty Ltd	Australia	5%	-	-
Advance Polymetrik Pty Ltd	Australia	4%	-	-
			-	-

Clarity Pharmaceuticals Pty Ltd. was incorporated in New South Wales, Australia on 17 September 2010.

Advance Polymetrik Pty Ltd. was incorporated in Victoria, Australia on 20 December 2001.

	Consolidated 2013 $'000	Consolidated 2012 $'000
8 Non-financial assets		
8A. Land and buildings		
Land - 30 June fair value	**97,200**	97,200
	97,200	97,200
Buildings - 30 June fair value	**159,098**	148,858
Less accumulated depreciation	**11,858**	9,144
	147,240	139,714
Building under construction	**58,191**	44,490
Total buildings	**205,431**	184,204
Total land and buildings		
8B. Infrastructure, plant and equipment and major facilities		
8B(i). Plant and equipment		
Plant and equipment - 30 June fair value	**303,459**	294,808
Less accumulated depreciation	**137,541**	107,820
	165,918	186,988
Plant and equipment under construction	**155,214**	93,201
Total plant and equipment	**321,132**	280,189
8B(ii). Infrastructure		
Electrical/site services facilities - 30 June fair value	**28,580**	28,248
Less accumulated depreciation	**3,299**	-
	25,281	28,248
Total infrastructure	**25,281**	28,248
8B(iii). Major national and major research facilities		
Major national research facilities - 30 June fair value	**14,525**	7,128
Less accumulated depreciation	**1,229**	-
	13,296	7,128
Major research facilities- 30 June fair value	**6,147**	6,122
Less accumulated depreciation	**324**	-
	5,823	6,122
OPAL nuclear research reactor - 30 June fair value	**419,915**	418,802
Less accumulated depreciation	**24,639**	44
	395,276	418,758
Total major national and major research facilities	**414,395**	432,008
Total infrastructure, plant and equipment and major facilities	**760,808**	740,445
Total land, buildings, infrastructure, plant and equipment and major facilities	**1,063,439**	1,021,849

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

Movement summary 2012-13 for all consolidated assets irrespective of valuation basis (excluding intangibles)

	Land	Buildings	Total Land and Buildings	Infrastructure, plant, equipment national and major facilities	Total
	$'000	$'000	$'000	$'000	$'000
Gross value as at 1 July 2012	97,200	193,348	290,548	848,309	1,138,857
Additions - new assets	-	15,713	15,713	82,802	98,515
Revaluation increment / (decrement)	-	(77)	(77)	1,350	1,273
Revaluation Adjustment	-	-	-	(222)	(222)
Decommissioning Cost	-	8,791	8,791	526	9,317
Transfers/reclassifications	-	(138)	(138)	138	-
Impairment of asset	-	(348)	(348)	(3,116)	(3,464)
Disposals	-	-	-	(1,967)	(1,967)
Gross value as at 30 June 2013	97,200	217,289	314,489	927,820	1,242,309
Accumulated depreciation/ amortisation 1 July 2012	-	9,144	9,144	107,864	117,008
Depreciation/amortisation	-	10,306	10,306	51,509	61,815
Impairment losses	-	-	-	415	415
Transfers/reclassifications	-	(7,592)	(7,592)	7,592	-
Revaluation Adjustment	-	-	-	(222)	(222)
Adjustment for disposals	-	-	-	(146)	(146)
Accumulated depreciation/ amortisation 30 June 2013	-	11,858	11,858	167,012	178,870
Net book value as at 30 June 2013	97,200	205,431	302,631	760,808	1,063,439

Movement summary 2011-12 for all consolidated assets irrespective of valuation basis (excluding intangibles)

	Land	Buildings	Total Land and Buildings	Infrastructure, plant, equipment national and major facilities	Total
	$'000	$'000	$'000	$'000	$'000
Gross value as at 1 July 2011	78,700	167,859	246,559	891,115	1,137,674
Additions - new assets	-	34,443	34,443	64,206	98,649
Revaluation increment / (decrement)	18,500	22,716	41,216	50,299	91,515
Revaluation Adjustment	-	(29,679)	(29,679)	(161,696)	(191,375)
Decommissioning Cost	-	2,934	2,934	2,047	4,981
Transfers/reclassifications	-	(4,925)	(4,925)	4,681	(244)
Disposals	-	-	-	2,343)	(2,343)
Gross value as at 30 June 2012	97,200	193,348	290,548	848,309	1,138,857
Accumulated depreciation/ amortisation 1 July 2011	-	37,395	37,395	194,602	231,997
Depreciation/amortisation	-	1,428	1,428	75,899	77,327
Revaluation Adjustment	-	(29,679)	(29,679)	(161,696)	(191,375)
Adjustment for disposals	-	-	-	(941)	(941)
Accumulated depreciation/ amortisation 30 June 2012	-	9,144	9,144	107,864	117,008
Net book value as at 30 June 2012	97,200	184,204	281,404	740,445	1,021,849

Note:
No impairment booked for property, plant and equipment for 2012 (2011: $3,711).
No item of property, plant or equipment are expected to be sold or disposed of within the next 12 months.

	Consolidated	
	2013	2012
	$'000	$'000
8C. Inventories		
Raw materials and stores-not held for resale		
Stores - at cost	**13,125**	9,757
Cobalt-60 sources - at net realisable value	**165**	188
Reactor fuel and heavy water - at average purchase price	**7,456**	11,220
Provision for stock diminution	**-**	(17)
	20,746	21,148
Work in progress - at cost	**496**	562
Finished goods - at cost	**394**	537
Total inventories	**21,636**	22,247
8D. Intangibles		
Licences at cost	**2,678**	1,224
Less accumulated amortisation	**1,667**	1,111
	1,011	113
Design fees at cost	**1,568**	1,562
Less accumulated amortisation	**724**	357
	844	1,205
Intellectual property at cost	**51,210**	1,125
Less accumulated amortisation	**-**	-
	51,210	1,125
Software at cost	**36,344**	35,217
Less accumulated amortisation	**28,786**	26,052
	7,558	9,165
Software under construction	**12,862**	9,192
Total intangibles	**73,485**	20,800

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

Movement summary 2012-13 for all consolidated intangibles irrespective of valuation basis

	Licenses	Design Fees	Intellectual Property	Software	Total
	$'000	$'000	$'000	$'000	$'000
Gross value as at 1 July 2012	1,224	1,562	1,125	44,409	48,320
Additions - new assets	1,454	6	-	4,797	6,257
NTP - IP	-	-	50,085	-	50,085
Gross value as at 30 June 2013	2,678	1,568	51,210	49,206	104,662
Accumulated depreciation/ amortisation 1 July 2012	1,111	357	-	26,052	27,520
Depreciation/amortisation	556	367	-	2,734	3,657
Accumulated depreciation/ amortisation 30 June 2013	1,667	724	-	28,786	31,177
Net book value as at 30 June 2013	1,011	844	51,210	20,420	73,485

Movement summary 2012-2012 for all consolidated intangibles irrespective of valuation basis

	Licenses	Design Fees	Intellectual Property	Software	Total
	$'000	$'000	$'000	$'000	$'000
Gross value as at 1 July 2011	1,224	1,882	-	36,938	40,044
Additions - new assets	-	1,655	1,125	7,227	10,007
Transfer/Reclassification	-	(1,975)	-	244	(1,731)
Gross value as at 30 June 2012	1,224	1,562	1,125	44,409	48,320
Accumulated depreciation/ amortisation 1 July 2011	1,039	398	-	19,659	21,096
Depreciation/amortisation	72	590	-	6,084	6,746
Transfer/Reclassification	-	(631)	-	-	(631)
Write back of accumulated depreciation	-	-	-	309	309
Accumulated depreciation/ amortisation 30 June 2011	1,111	357	-	26,052	27,520
Net book value as at 30 June 2012	113	1,205	1,125	18,357	20,800

Note:
No indicators of impairment were found for intangible assets.
No Intangibles are expected to be sold or disposed of within the next 12 months.

	Consolidated	
	2013	2012
	$'000	$'000
8E. Other non-financial assets		
Deferred tax asset	930	1,200
Prepayments	2,692	2,643
	3,622	3,843

	Consolidated	
	2013	2012
	$'000	$'000
9 Liabilities		
9A. Interest bearing liabilities		
Other (a)	**-**	52
Total interest bearing liabilities	**-**	52
Provision		
9B. Employee provisions		
Annual leave	**12,531**	11,202
Long service leave	**23,183**	20,171
	35,714	31,373
Employee provisions are expected to be settled in:		
No more than 12 months	**6,204**	5,544
More than 12 months	**29,510**	25,829
Total employee provisions	**35,714**	31,373
9C. Decommissioning provisions		
Decommissioning cost (c)	**286,568**	263,011
	286,568	263,011
9D. Provision for intellectual property payment		
Provision for intellectual property payment	**48,680**	-
	48,680	-
9E. Other		
Other claims (b)	**47**	45
	47	45
Total provision	**371,009**	294,429
Payables		
9F. Suppliers		
Trade creditors	**13,860**	14,786
Total suppliers	**13,860**	14,786
Supplier payables expected to be settled within 12 months		
Related entities	**763**	8
External parties	**13,097**	14,778
Total suppliers	**13,860**	14,786
9G. Employees		
Accrued salaries and wages	**3,033**	2,980
Redundancy payment	**323**	25
Incentives	**2,848**	2,539
	6,204	5,544
9H. Grants		
Non-profit entities	**682**	481
	682	481

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

		Consolidated	
		2013	2012
		$'000	$'000
9I	**Other**		
	Revenue received in advance	**14,359**	1,480
	Other Payables	**142**	-
		14,501	1,480
	Total payables	**35,247**	22,291

Notes:
(a) Relates to prepaid revenue under a lease of property.

(b) This provision includes redundancy.

(c) This provision includes decommissioning cost relating to property, plant and equipment and infrastructure and local and overseas legacy waste and current OPAL waste disposition.

9J. Provision movement reconciliation

	Provision for Decommissioning Costs	Provision for intellectual property payment	Provision for Other Claims
	$'000	**$'000**	**$'000**
Carrying amount 1 July 2011	**291,465**	**-**	**286**
Provisions not required	(2,893)	-	(241)
Additional provisions made	4,981	-	-
Amounts used	(5,273)	-	-
Change in accounting estimate	(37,567)	-	-
Unwinding discount	12,298	-	-
Closing balance 30 June 2012	**263,011**	**-**	**45**
Carrying amount 1 July 2012	**263,011**	**-**	**45**
Provisions not required	**-**	**-**	**-**
Additional provisions made	**9,317**	**48,680**	**2**
Amounts used	**(3,629)**	**-**	**-**
Change in accounting estimate	**3,109**	**-**	**-**
Unwinding discount	**14,760**	**-**	**-**
Closing balance 30 June 2013	**286,568**	**48,680**	**47**

	Consolidated	
	2013	2012
	$'000	$'000
10 Equity		
Contributed equity		
Replacement research reactor equity injections		
Balance 1 July	**385,836**	385,836
Balance 30 June	**385,836**	385,836
Other equity injections		
Balance 1 July	**103,520**	96,120
Equity injections from Government	**71,500**	7,400
Balance 30 June	**175,020**	103,520
Total contributed equity	**560,856**	489,356
Reserves, including movements		
Asset revaluation reserve		
Balance 1 July	**468,256**	339,108
Revaluation - Decommissioning	**(1,360)**	38,172
Revaluation - Assets	**1,273**	90,976
Balance 30 June	**468,169**	468,256
OPAL depreciation reserve		
Balance 1 July	**9,061**	9,061
Balance 30 June (a)	**9,061**	9,061
Regional security of radioactive reserve		
Balance 1 July	**228**	567
Transferred to retained deficit (b)	**(68)**	(339)
Balance 30 June	**160**	228
Low Dose Nuclear Waste Repository		
Balance 1 July	**1,074**	1,074
Transferred to retained deficit (c)	**-**	-
Balance 30 June	**1,074**	1,074
Intermediate low level waste (ILLW) return		
Balance 1 July	**1,652**	785
Transferred from retained deficit (d)	**1,569**	867
Balance 30 June	**3,221**	1,652
Foreign currency reserve		
Balance 1 July	**70**	214
Movement (e)	**229**	(144)
Balance 30 June	**299**	70
Total reserves	**481,984**	480,341

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

		Consolidated	
		2013	2012
		$'000	$'000
10 Equity (continued)			
Retained deficit			
Retained deficit 1 July		**(130,962)**	(95,085)
Transfer from OPAL depreciation reserve	(a)	**-**	-
Transfer from regional security of radioactive reserve	(b)	**68**	339
Transfer from Low Dose Nuclear Waste Repository	(c)	**-**	-
Transfer to Intermediate low level waste (ILLW) return	(d)	**(1,569)**	(867)
Transfer to other reserve		**-**	-
Transfer to foreign currency reserve		**-**	-
(Deficit)		**(32,135)**	(35,349)
Retained deficit 30 June		**(164,598)**	(130,962)
Total equity		**878,242**	838,735

(a) OPAL depreciation reserve
This reserve represents unused funding for OPAL depreciation. This was due to a delay in final commissioning of OPAL.

(b) Regional security of radioactive materials reserve
This represents unused funding from prior years. This is due to delays in participation by some regional countries.

(c) Low Dose Nuclear Waste Repository
This reserve relates to funding for low level waste facility at ANSTO for its own use and used by other Commonwealth agencies.

(d) Intermediate low level waste (ILLW) return
This reserve relates to unspent appropriation for ILLW return.

(e) Foreign currency reserve
This reserve relates to foreign currency translation at balance date.

11 Cash flow reconciliation

	Notes	Consolidated 2013 $'000	2012 $'000
Reconciliation of Operating Surplus (Deficit) to Net Cash from Operating Activities:			
Operating (deficit)		**(32,135)**	(35,349)
Non-cash items			
Depreciation/amortisation		**65,887**	84,073
Reversal of write-down of Investment		**(5,000)**	-
Net loss on disposal of non-financial assets		**4,852**	1,262
Writedown and impairment of assets		**(4,324)**	-
Unrealised foreign exchange (gain) loss		**834**	89
Unwinding of Discount - decommissioning costs		**16,559**	50,098
Changes in assets and liabilities			
(Increase)/Decrease in trade goods and services receivables		**2,265**	(4,736)
(Increase)/Decrease in other receivables		**(2,179)**	(80)
(Increase)/Decrease in GST receivables		**(89)**	210
(Increase)/Decrease in accrued interest		**(159)**	336
(Increase) in prepayments		**55**	4,612
(Increase)/Decrease in inventories		**611**	(6,618)
Increase/(Decrease) in payables		**(926)**	3,314
Increase in employee entitlements		**3,284**	4,553
Increase/(Decrease) in revenue received in advance		**9,262**	(159)
Increase/(Decrease) in deferred income tax		**270**	(1,200)
Increase/(Decrease) in other provision		**1,806**	(241)
Increase/(Decrease) in decommissioning cost provision		**(520)**	(45,731)
Increase/(Decrease) in interest bearing liabilities		**(52)**	(2,432)
Net cash from operating activities		**60,301**	52,001

12 Government funding

Revenue from Government		**157,605**	157,676
Government equity injection		**1,400**	1,400
Education Investment Fund equity injection		**70,100**	6,000
		229,105	165,076

Appropriations are made to the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) which are then paid to ANSTO.

ANSTO does not receive any Departmental Capital Budget (DCB).

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

13 Board membership

The members of the Board during the financial year and to the date of the report on the statements were:

Member	Appointed	Term Concluded	Reappointed	Term Concludes
P Greenfield	25 July 2010			24 July 2014
C McLoughlin	13 March 2009	12 March 2013		
A Scott	29 September 2011			28 September 2016
D Copolov	28 June 2012			27 June 2016
E Smyth	12 December 2008	11 December 2012	14 March 2013	13 March 2018
S Pond	1 July 2010			30 June 2014
J Ryan	24 February 2011			23 February 2016
J Raper	28 June 2012			27 June 2016
A Paterson	1 March 2009			28 February 2014

For the 2012-13 financial year the aggregate remuneration paid to members of the Board is disclosed in Note 14.

14 Remuneration of members of the Board

	Consolidated	
	2013 Number	2012 Number
The number of non-executive directors of ANSTO included in these figures are shown below in the relevant remuneration bands:		
Remuneration between		
$0 to $29,999	**2**	1
$30,000 to $59,999	**5**	7
$60,000 to $89,999	**1**	1
$120,000 to $149,999	**-**	-
Total	**8**	9
Total remuneration received or due and receivable by directors of the entity	319,647	320,231

Remuneration of the Chief Executive Officer is included in Note 15: Remuneration of senior executives.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

15 Remuneration of senior executives

Note 15A: Senior Executive Remuneration Expense for the Reporting Period

	Consolidated	
	2013	2012
	$	$
Short-term employee benefits:		
Salary	**4,331,295**	3,595,359
Annual leave accrued	**347,460**	276,682
Performance bonuses	**752,500**	454,188
Motor vehicle and other allowance	**40,907**	53,492
Total short-term employee benefits	**5,472,162**	4,379,721
Post-employment benefits:		
Superannuation	**585,184**	578,378
Total post-employment benefits	**585,184**	578,378
Other long-term benefits:		
Long-service leave	**135,513**	115,089
Total other long-term benefits	**135,513**	115,089
Termination benefits	**-**	-
Total	**6,192,859**	5,073,188

Notes:
1. Note 15A is prepared on an accrual basis.

2. Note 15A excludes acting arrangements and part-year service where remuneration expensed for a senior executive was less than $180,000.

Note 15B: Average Annual Remuneration Packages and Bonus Paid for Substantive Senior Executives as at the end of the Reporting Period

	Consolidated as at 30 June 2013					
Average annual reportable remuneration1	**Substantive Senior Executives No.**	**Reportable salary2 $**	**Contributed Superannuation3 $**	**Reportable allowances4 $**	**Bonus paid5 $**	**Total reportable remuneration $**
Total remuneration (including part-time arrangements):						
$210,000 to $239,999	**2**	**173,738**	**29,960**	**-**	**25,503**	**229,201**
$240,000 to $269,999	**1**	**207,422**	**21,897**	**-**	**35,884**	**265,203**
$270,000 to $299,999	**4**	**214,586**	**34,609**	**-**	**36,086**	**285,281**
$300,000 to $329,999	**2**	**237,613**	**35,376**	**-**	**41,269**	**314,258**
$330,000 to $359,999	**2**	**264,331**	**30,498**	**-**	**45,782**	**340,611**
$360,000 to $389,999	**2**	**283,849**	**27,150**	**-**	**53,557**	**364,556**
$390,000 to $419,999	**1**	**322,752**	**32,933**	**-**	**52,671**	**408,356**
$510,000 to $539,999	**-**	**-**	**-**	**-**	**-**	**-**
$540,000 to $569,999	**1**	**430,236**	**39,091**	**-**	**80,466**	**549,793**
Total	**15**					

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

	Consolidated as at 30 June 2012					
Average annual reportable remuneration1	**Substantive Senior Executives No.**	**Reportable salary2 $**	**Contributed Superannuation3 $**	**Reportable allowances4 $**	**Bonus paid5 $**	**Total reportable remuneration $**
Total remuneration (including part-time arrangements):						
$210,000 to $239,999	-	-	-	-	-	-
$240,000 to $269,999	-	-	-	-	-	-
$270,000 to $299,999	4	211,098	36,407	-	35,481	282,986
$300,000 to $329,999	1	273,490	24,844	-	7,064	305,398
$330,000 to $359,999	4	278,236	34,473	-	44,858	357,567
$360,000 to $389,999	-	-	-	-	-	-
$390,000 to $419,999	1	310,425	33,306	-	47,431	391,162
$510,000 to $539,999	1	393,663	59,106	-	60,919	513,688
$540,000 to $569,999	-	-	-	-	-	-
Total	11					

Notes

1. This table reports substantive senior executives who received remuneration during the reporting period. Each row is an averaged figure based on headcount for individuals in the band.
2. 'Reportable salary' includes the following:
   a) gross payments (less any bonuses paid, which are separated out and disclosed in the 'bonus paid' column);
   b) reportable fringe benefits (at the net amount prior to 'grossing up' for tax purposes);
   c) exempt foreign employment income; and
   d) salary sacrificed benefits."
3. The 'contributed superannuation' amount is the cost to the entity for the provision of superannuation to substnative senior executives in that reportable remuneration band during the reporting period.
4. 'Reportable allowances' are the average actual allowances paid as per the 'total allowances' line on individuals' payment summaries.
5. 'Bonus paid' represents average actual bonuses paid during the reporting period in that reportable remuneration band. The 'bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.

Note 15C: Average Annual Reportable Remuneration Paid to Other Highly Paid Staff during the Reporting Period

	Consolidated as at 30 June 2013					
Average annual reportable remuneration1	**Staff No.**	**Reportable salary2 $**	**Contributed Superannuation3 $**	**Reportable allowances4 $**	**Bonus paid5 $**	**Total $**
Total remuneration (including part-time arrangements):						
$180,000 to $209,999	**32**	**161,885**	**25,443**	**11**	**5,928**	**193,267**
$210,000 to $239,999	**10**	**172,440**	**28,504**	**4**	**19,497**	**220,445**
$240,000 to $269,999	**1**	**197,765**	**36,481**	**-**	**31,894**	**266,140**
$270,000 to $299,999	**-**	**-**	**-**	**-**	**-**	**-**
$300,000 to $329,999	**2**	**246,801**	**27,559**	**-**	**33,143**	**307,503**
Total	**45**					

	Consolidated as at 30 June 2013					
Average annual reportable remuneration1	**Staff No.**	**Reportable salary2 $**	**Contributed Superannuation3 $**	**Reportable allowances4 $**	**Bonus paid5 $**	**Total $**
Total remuneration (including part-time arrangements):						
$180,000 to $209,999	18	159,706	21,896	-	13,385	194,987
$210,000 to $239,999	2	185,059	28,095	-	2,556	215,710
$240,000 to $269,999	2	221,385	22,401	-	13,551	257,337
$270,000 to $299,999	1	227,952	41,556	-	23,300	292,808
$300,000 to $329,999	-	-	-	-	-	-
Total	23					

Notes
1. This table reports staff:
   a) who were employed by the entity during the reporting period;
   b) whose reportable remuneration was $180,000 or more for the financial period; and
   c) were not required to be disclosed in Tables B or director disclosures.

Each row is an averaged figure based on headcount for individuals in the band.
2. 'Reportable salary' includes the following:
   a) gross payments (less any bonuses paid, which are separated out and disclosed in the 'bonus paid' column);
   b) reportable fringe benefits (at the net amount prior to 'grossing up' for tax purposes);
   c) exempt foreign employment income; and
   d) salary sacrificed benefits."
3. The 'contributed superannuation' amount is the average cost to the entity for the provision of superannuation benefits to substantive senior executives in that reportable remuneration band during the reporting period.
4. 'Reportable allowances' are the average actual allowances paid as per the 'total allowances' line on individuals' payment summaries.
5. 'Bonus paid' represents average actual bonuses paid during the reporting period in that reportable remuneration band. The 'bonus paid' within a particular band may vary between financial years due to various factors such as individuals commencing with or leaving the entity during the financial year.

16 OPAL Nuclear Research Reactor

In the 2012-13 financial year, the OPAL research reactor operated for 265 days at high power, which translates to a total availability of 73% and a planned availability against the schedule of 97%. OPAL continues to demonstrate it remains one of the world's most highly available multipurpose research reactors.

OPAL undertook an extensive six week shutdown during the 2012-13 financial year, which included a plant modification to install a major new beam line for neutron scattering science purposes. This investment increased OPAL's research capability.

Successful production of reactor based radio-pharmaceuticals, neutron activation analysis for scientific research, and irradiation of neutron transmutation doped silicon was achieved during the year. The efficiency of the delivery of these products and services was enhanced through the ANSTO wide operational excellence initiative.

The Cold Neutron Source, which supplies important low energy neutrons for research, was modified during the year to provide greater availability and reliability in operation.

ANSTO plans to operate the reactor for about 295 days in 2013-14.

17 Insurances

Insurance risks, including professional indemnity, general liability, industrial special risk for property used substantially for commercial purposes, directors and officers, and travel, are placed through Comcover, the Government's insurable risk managed fund.

Workers compensation is insured through Comcare Australia and by virtue of statute under the *Safety Rehabilitation and Compensation Act 1988.*

A Deed of Indemnity between the Commonwealth Government and ANSTO, under which the government has formally agreed to indemnify ANSTO and ANSTO Officers from any loss or liability arising from claims caused by ionising radiation, remains in place until August 2018. This indemnity does not specify that subsidiaries are included.

18 Remuneration of auditors

	Consolidated	
	2013	2012
	$'000	$'000
Amounts received or due and receivable by ANAO for:		
An audit or review of the financial report of the entity and any other entity in the consolidated entity	**223,500**	168,500
Other services in relation to the entity and any other entity in the consolidated entity		
- assurance related	**28,875**	-
- special audits required by regulators	**5,000**	5,000
- other non-audit related	**23,100**	-
Amounts received or due and receivable by entities other than the ANAO for:		
An audit or review of the financial report of the entity and any other entity in the consolidated entity	**7,600**	6,000
	288,075	179,500

No other services were provided by the Auditor-General during the reporting period.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

19 Related party disclosures

Several ANSTO Board Members were associated with entities with which ANSTO had commercial transactions during the year as part of their role in hospitals or universities. All such transactions were in accordance with ANSTO's normal commercial terms and conditions. None of those transactions led to any conflict of interest.

20 Trust money

	Consolidated	
	2013 $'000	2012 $'000
ANSTO receives monies from trade creditors as security deposits for contracts to be performed. These monies are held in a Trust Account and refunded to the respective trade creditors on satisfactory completion of the contract.		
Balance 1 July	**8**	7
Add: receipts	**-**	1
Deduct: payments	**-**	-
Balance 30 June	**8**	8

21 Financial instruments

(a) Categories of financial instruments

Financial Instruments	Notes	Consolidated			
		Carrying Amount 2013 $'000	**Fair Value 2013 $'000**	Carrying Amount 2012 $'000	Fair Value 2012 $'000
Financial assets					
Loans and receivables					
Cash at bank	7A	**3,899**	**3,899**	3,411	3,411
Investment held to maturity	7C	**98,083**	**98,083**	67,389	67,389
Investment	7C	**5,000**	**5,000**	-	-
Receivables for goods and services	7B	**11,190**	**11,190**	14,251	14,251
Interest accrued	7B	**451**	**451**	292	292
Other	7B	**3,027**	**3,027**	848	848
Total financial assets (recognised)		**121,650**	**121,650**	86,191	86,191
Total financial liabilities					
At amortised cost					
Trade creditors	9F	**13,860**	**13,860**	14,786	14,786
Employees	9G	**6,204**	**6,204**	5,544	5,544
Grant received in advance	9H	**682**	**682**	481	481
Interest bearing liabilities	9A	**-**	**-**	52	52
Other	9I	**14,501**	**14,501**	1,480	1,480
Total financial liabilities (recognised)		**35,247**	**35,247**	22,343	22,343

21 Financial instruments (cont.)

(b) Net income from financial assets

Financial Instruments	Notes	Consolidated	
		2013 $'000	2012 $'000
Financial assets			
Loans and receivables			
Cash at bank	7A	**77**	124
Investment held to maturity	7C	**3,237**	4,916
Net Income from financial assets		**3,314**	5,040

(c) Net expenses from financial liabilities

Financial liabilities			
At amortised cost			
Interest bearing liabilities	9A	**-**	192
Net expenses from financial liabilities		**-**	192

Financial assets

The net fair values of cash, deposits on call and non-interest-bearing monetary financial assets are in accord with their carrying amounts

Loans receivable are carried at cost, which is above their net fair value, because it is intended to hold them to maturity.

Financial liabilities

The net fair values for trade creditors and revenue received in advance, all of which are short-term in nature, are in accord with their carrying amounts.

(d) Credit risk exposures

The maximum exposure to credit risk is the risk that arises from potential default of a debtor. This is equal to the total amount of trade and other receivables as per note 7B. ANSTO has assessed the risk of the default on payment and has provided for doubtful debts account as per note 7B(b).

ANSTO manages its credit risk by undertaking background and credit checks prior to allowing a debtor relationship. In addition, the Organisation has policies and procedures that guide employees to apply debt recovery techniques. The Organisation holds no collateral to mitigate against credit risk.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

21 Financial instruments (cont.)

(e) Liquidity risk

ANSTO financial liabilities are payables and other interest bearing liabilities. The exposure to liquidity risk is based on the notion that the Organisation will encounter difficulty in meeting its obligations associated with financial liabilities. This is highly unlikely due to Australian Government Appropriation funding and mechanism available to the Organisation and internal policies and procedures put in place to ensure there are appropriate resources to meet its financial obligations.

Consolidated

Financial Instruments	**Notes**						
		Consolidated					
2013		**Carrying Amount**	**On Demand**	**1 Year or Less**	**1 to 2 Years**	**More than 2 years**	**Total Contractual Cash Flows**
		$'000	**$'000**	**$'000**	**$'000**	**$'000**	**$'000**
Financial liabilities							
Trade creditors	9F	**13,860**	**-**	**13,860**	**-**	**-**	**13,860**
Employees	9G	**6,204**	**-**	**6,204**	**-**	**-**	**6,204**
Grant received in advance	9H	**682**	**-**	**682**	**-**	**-**	**682**
Interest bearing liabilities	9A	**-**	**-**	**-**	**-**	**-**	**-**
Other	9I	**14,501**	**-**	**14,501**	**-**	**-**	**14,501**
Total financial liabilities (recognised)		**35,247**	**-**	**35,247**	**-**	**-**	**35,247**
		Consolidated					
2012		Carrying Amount	On Demand	1 Year or Less	1 to 2 Years	More than 2 years	Total Contractual Cash Flows
		$'000	$'000	$'000	$'000	$'000	$'000
Financial liabilities							
Trade creditors	9F	14,786	-	14,786	-	-	14,786
Employees	9G	5,544	-	5,544	-	-	5,544
Grant received in advance	9H	481	-	481	-	-	481
Interest bearing liabilities	9A	52	-	52	-	-	52
Other	9I	1,480	-	1,480	-	-	1,480
Total financial liabilities (recognised)		22,343	-	22,343	-	-	22,343

21 Financial instruments (cont.)

(f) Market risk - consolidated

(i) Interest rate risk
This refers to the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. ANSTO is exposed to interest rate risk primarily from Investment held to maturity. The impact as shown below.

Risk variable	Consolidated					
	Change in variable		Effect on		Effect on	
	2013	2012	**1.20%**	**-1.20%**	1.40%	-1.40%
			Profit or loss	**Equity**	Profit or loss	Equity
$'000			**2013 $'000**	**2013 $'000**	2012 $'000	2012 $'000
Investment held to maturity	**98,083**	67,389				
Interest	**1.20%**	1.40%	**1,177**	**1,177**	943	943
Interest	**-1.20%**	-1.40%	**(1,177)**	**(1,177)**	(943)	(943)

Interest rate sensitivity analysis has been calculated on a 'reasonably possible' change basis. A 'reasonably possible' change has been estimated using both statistical and non-statistical analyses. The statistical analysis has been based on the cash rate for the past five years issued by the Reserve Bank of Australia (RBA) as the underlying dataset. This information is then revised and adjusted for reasonableness under the current economic circumstances.

As a result of the analyses above, a standard rate of 120 basis points (2012: 140 basis points) shock level was selected as a 'reasonably possible' change in market interest rate.

120 basis points is managements best estimate of future volatility.

(ii) Foreign currency rate
This refers to the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign currency rates. ANSTO is exposed to foreign currency rate risk primarily from trade creditors. The impact only relates to assets and not profit and loss or equity.

Risk variable	Consolidated					
	Change in variable		Effect on		Effect on	
	2013	**2012**	**15.70%**	**-15.70%**	**15.00%**	**-15.00%**
			Profit or loss	**Equity**	Profit or loss	Equity
$'000			**2013 $'000**	**2013 $'000**	2012 $'000	2012 $'000
USD Currency	**325**	184				
Foreign currency	**15.70%**	15.00%	**51**	**51**	29	29
Foreign currency	**-15.70%**	-15.00%	**(51)**	**(51)**	(29)	(29)

The method used to arrive at the possible risk of 15.7% (2012, 15%) was based on both statistical and non-statistical analyses. The statistical analysis has been based on main currencies movement for the last five years. The two main currencies ANSTO has exposure to are USD and EURO currencies. This information is then revised and adjusted for reasonableness under the current economic circumstances.

15.7% (2012, 15%) is managements best estimate of future USD foreign exchange volatility.

(g) Reconciliation of level 3 fair value hierarchy

	Investments	
	2013 $'000	2012 $'000
Opening balance	**-**	**5,000**
Total gains or losses for the period recognised in profit and loss	**5,000**	**5,000**
Closing Balance	**5,000**	-

Last year the investment in Australian Synchrotron Holding Company of $5M was assessed as requiring impairment testing and due to the uncertainty regarding future funding, the decision was taken that the investment be fully impaired. A reassessment of this investment is required this year. Due to the changed circumstances resulting in the securing of future funding and ANSTO being chosen as preferred operator from 1 January 2013, Management has determined to fully reverse the impairment this year.

Notes to and forming part of the Financial Statements for the year ended 30 June 2013

	Consolidated	
	2013	2012
	$'000	$'000
22 Operating lease arrangements		
Payment recognised as expense		
Minimum lease payments	**193**	193
	193	193
Operating lease commitments		
One year or less	**137**	137
From one to five years	**685**	685
Over five years	**766**	903
	1,588	1,725

ANSTO has a twenty five year lease contract with Central Sydney Area Health Services that will expire on 29 January 2025 with an annual rental payable of $137,000 (2011: $137,000).The annual rental is subject to review every three years.

23 Income tax expense (benefit)		
Current year tax charge	**451**	1,200
Timing difference	**(497)**	-
Over provision in respect of prior years	**(388)**	-
Total income tax expense (benefit)	**(434)**	1,200

ANSTO's subsidiaries are subject to normal taxation except for Synchrotron Light Source Australia Pty Ltd which is a tax exempt entity being charitable institution.

Unbooked deferred tax assets in relation to unrecouped tax losses including timing difference in the subsidiaries is $32 thousand (2012: $52 thousand). The total deferred tax assets recognised in relation to PETNET Australia Pty Ltd for 30 June 2013 is $929 thousand (2012: $1,200 thousand).

24 Other comprehensive income		
Changes in asset revaluation reserves		
Revaluation - Decommissioning	**1,360**	(38,172)
Revaluation - Assets	**(1,465)**	(90,976)
Total revaluation adjustments in other comprehensive income	**(105)**	(129,148)

25 Information relating to ANSTO ('the parent entity')

ANSTO only presents the financial statements on a Consolidated basis. A summary of ANSTO (parent company only) financial information is as follows:

	FINANCIAL YEAR	
	2013	2012
	$'000	$'000
Current assets	**114,489**	99,199
Total assets	**1,266,023**	1,155,946
Current liabilities	**24,812**	25,700
Total liabilities	**389,583**	316,531
Contributed equity	**560,856**	489,356
Retained surplus	**(166,018)**	(129,937)
Asset revaluation reserve	**468,086**	467,981
Other reserve	**13,516**	12,015
Total equity	**876,440**	839,415
Profit or loss of the parent entity	**(34,581)**	(35,043)
Total comprehensive income of the parent entity	**(34,476)**	93,829

25 Information relating to ANSTO ('the parent entity') (cont.)

The parent has issued the following guarantees in relation to the debts of its subsidiaries:

The ANSTO's Board has passed resolutions that in the event that its subsidiaries, PETNET Australia Pty Ltd and ANSTO Inc., do not meet their obligations under the terms of the overdrafts, loans, leases or other liabilities, ANSTO will guarantee its payments.

On 1 January 2013, ANSTO assumed operational control of the Synchrotron, through its wholly-owned subsidiary Synchrotron Light Source Australia Pty Ltd (SLSA). An Operating Services Agreement (OSA) was put in place between SLSA and the ASHCO the owner of the Synchrotron on 26 October 2012 and this agreement outlines the terms under which SLSA operates the Synchrotron.

SLSA was incorporated on 14 August 2012 and its sole purpose is to operate the Synchrotron. It has been established as a proprietary limited not-for-profit company under the Corporations Act 2001 and is limited by shares. As a wholly owned subsidiary of ANSTO, SLSA is also regulated under the Commonwealth Authorities and Companies Act 1997. The company is income tax exempt.

The parent has no contingent liability for 2013 (2012: nil)

26 Transfer of financial balances from ASCo closure

On 22 March 2013, $2,718,794 of cash was transferred from ASCo on phase 1 of the transfer of operations to SLSA. This included employee leave entitlements, contributions in advance, accrued revenue and prepayments. On 5 April 2013 $987,294 of cash was transferred from ASCo on its closure and this represented surplus balance.

	FINANCIAL YEAR
	2013 $'000
Cash	3,706
Accrued revenue	64
Prepayments (current and non-current)	103
Payables	(247)
Contributions in advance	(1,909)
Employee entitlements – annual leave	(1,080)
Employee entitlements – long service leave	(637)
	-

CORPORATE GOVERNANCE

ANSTO Statement on Corporate Governance

ANSTO is an Australian Government statutory authority with its own Board that is constituted under the provisions of the *Australian Nuclear Science and Technology Organisation Act 1987 (ANSTO Act)*. ANSTO reports to the Australian Parliament through the Minister for Industry.

The ANSTO Act defines the organisation's functions and powers and details the Board and the Chief Executive Officer's duties as well as staffing, financial management and governance arrangements necessary for the efficient and effective management of the organisation.

As a Government statutory authority, ANSTO's operations and governance arrangements are also subject to the provisions of the *Commonwealth Authorities and Companies Act 1997 (CAC Act)* and Regulations issued pursuant to that act.

In October 2012, ANSTO prepared and lodged an annual 'CAC Act – Compliance Report' with the Minister for Finance and Deregulation and ANSTO's responsible Minister, that confirmed ANSTO's compliance with the CAC Act and supporting regulations and General Policy Orders of the Commonwealth Government applicable to ANSTO, and which also confirmed ANSTO's ongoing financial sustainability.

As a Commonwealth statutory authority, ANSTO has established a corporate governance framework that meets and exceeds legislative requirements. In doing so, ANSTO strives to apply the principles of good corporate governance and to continuously improve its corporate governance practices.

ANSTO's governance structures and processes are underpinned by its corporate values and its Code of Ethics, and are regularly reviewed and adapted to accommodate organisational change and to reflect national and international best practice, where the organisation considers it appropriate to do so.

Responsible Ministers

As at 30 June 2013 the responsible Ministers were the Hon Dr Craig Emerson (MP), Minister for Tertiary Education, Skills, Science and Research; and Senator the Hon Don Farrell, Minister for Science and Research. Other responsible Ministers during the 2012 -13 financial year reporting period were The Hon Chris Bowen MP, Minister for Tertiary Education, Skills, Science and Research from 4 February 2013 to 25 March 2013; and Senator the Hon Christopher Evans, Minister for Tertiary Education, Skills, Science and Research from 14 December 2011 to 4 February 2013.

Under the ANSTO Act and CAC Act the Minister has the power to provide the ANSTO Board in writing, directions with respect to performance of the functions, or the exercise of the powers of the Board or the organisation, including compliance with general policies of the Commonwealth.

In this regard, the Minister has provided the ANSTO Board with a Statement of Expectations with regard to the Board's role in setting the strategic direction of the organisation, the governance of the organisation and the provision of information to the Minister. The Statement of Expectations is acknowledged by the Board through a Statement of Intent. These two documents can be viewed through the ANSTO web site at www.ansto.gov.au.

A Public Research Agency Charter has also been signed by the Minister and the Board. This document recognises the primary functions of ANSTO are to conduct scientific research and development in relation to the applications of nuclear science and technology; to deliver specialised advice, scientific services and products to government, universities, other research organisations, international organisations and businesses, and to operate unique nuclear facilities.

The Charter also provides clear guidance to ANSTO and its individual researchers on providing scientific advice and engaging in

public debate. The Charter can be viewed through the ANSTO web site at www.ansto.gov.au.

Nuclear liability

A Deed of Indemnity (executed on 27 August 2008, for a period of ten-years) commits the Commonwealth Government to meeting any damages awarded against ANSTO, its employees and contractors for damage caused by ionising radiation. This indemnity is supplemental to ANSTO's coverage under policies held with the Commonwealth's insurance body, Comcover.

Ministerial directions

No new Ministerial Directions, issued under either the ANSTO Act or CAC Act, were received by the ANSTO Board in 2012-13.

There are a number of Ministerial Directions received by the ANSTO Board in previous years that continued to be applicable to ANSTO's operations. These directions require ANSTO to comply with the following Australian Government policies:

- Commonwealth Fraud Control Guidelines
- Commonwealth Procurement Rules
- CAC Act Compliance Reporting
- Australian Government Employment Bargaining Framework.

In addition to the above directions, ANSTO has elected to comply with the following 'General Policy Orders' of the Australian Government:

- Australian Government Foreign Exchange Risk Management Guidelines
- Australian Government Cost Recovery Guidelines
- Australian Government Competitive Neutrality Guidelines
- Protective Security Policy Framework.

Notification of 'Significant' Events

Under sections 15 and 16 of the CAC Act and in accordance with the Minister's Statement of Expectations, ANSTO is required to provide the Minister with written notification of specified events and more generally to keep the responsible Minister informed of its operations and those of its subsidiaries.

During the period 2012-13, one such notification was provided to the Minister. This notification related to the entry by ANSTO and its subsidiary Synchrotron Light Source Australia Pty Ltd into a Parent Company Guarantee, an Operating Services Agreement and associated funding agreements with the Australian Synchrotron Holding Company Pty Ltd. Under this agreement, the ANSTO subsidiary took over as operator of the Synchrotron from 1 January 2013.

ANSTO Board

ANSTO is governed by a Board which is responsible to the Australian Government for the overall direction, performance and governance of the organisation.

ANSTO's Corporate Governance framework supports the effective operation of the ANSTO Board to execute their statutory and fiduciary duties under the ANSTO and CAC Acts.

The general functions of the Board, as set out in the ANSTO Act, are to ensure the proper and efficient performance of the functions of the organisation and to determine the policy of the organisation with respect to any matter, having regard to the current policies of the Commonwealth Government.

The responsibilities and duties of the Board and its relationship with Executive Management are set out in a Board Charter. The Charter can be viewed through the ANSTO web site at www.ansto.gov.au.

The principal governance responsibilities of the Board are to:

- select, appoint and monitor the performance of the Chief Executive Officer
- establish and monitor the strategic direction of the organisation
- determine and approve the 'major' policies of the organisation
- oversee the operations of the organisation ensuring the organisation operates in a safe, responsible and ethical manner, compliant with legal and regulatory obligations
- monitor financial performance
- ensure the establishment of effective organisational governance, risk management, compliance, and assurance mechanisms

The operation and performance of the ANSTO Board and its members are also governed by the CAC Act, which establishes a range of integrity, accountability and governance arrangements that are to be adopted by all CAC agency Boards.

A key obligation under the CAC Act is the need for Board members to disclose any material personal interests in a matter that is being considered by the Board, and prohibits participation, deliberation and decision-making by any member on such matters. As evaluated as part of the 'CAC Act – Compliance Report', the Board is satisfied that it has discharged its duties and obligations in accordance with the relevant CAC Act requirements.

The effectiveness and performance of the Board and the individual members of the Board are evaluated on an annual basis. The Board Chairman leads the evaluation process.

The remuneration and allowances payable to members of the Board, including the Chief Executive Officer, are determined by the Australian Government Remuneration Tribunal. Remuneration of members of the Board is disclosed in ANSTO's Annual Report.

Related entity transactions

During the reporting period the ANSTO Board did not make any related entity decisions as per the Commonwealth Authorities (Annual Reporting) Orders 2011.

Composition of the Board

ANSTO's Board comprises the Chief Executive Officer and eight non-executive members, drawn from the broader community, who are not involved in the day-to-day management of the organisation. All non-executive members are appointed by the Governor-General. The Chief Executive is appointed by the ANSTO Board, in consultation with the Minister.

The Chief Executive Officer manages the affairs of ANSTO, subject to the directions of, and in accordance with, policies determined by the Board. Senior management attend Board meetings as required to report on matters relevant to their individual areas of responsibility.

Each Board member brings complementary skills and experience to the Board relevant to the principal activities and operations of ANSTO.

Board members are able to seek independent professional advice, in the interests of their role and duties on the Board. Newly appointed Board members are inducted in the organisation's operations and activities, and their duties and responsibilities as a Board member of a Commonwealth Statutory Authority.

The Board meets regularly in accordance with a formally approved timetable and agenda. Six Board meetings were held during the 2012-13 financial year. Details of the number of Board meetings attended by each member during the financial year 2012-13 are outlined in **Table 1.**

Board committees

The ANSTO Board operates a Risk and Audit Committee (RAC), in accordance with CAC Act requirements and corporate governance best practice, and a Remuneration Committee.

Risk and Audit Committee

The overall purpose of the RAC is to provide independent assurance and assistance to the Board on ANSTO's risk, control and compliance framework, and its external accountability responsibilities.

The RAC primarily assists the Board in overseeing:

- the integrity of the organisation's risk and compliance management processes, including the effective management of key organisational risks
- compliance with legal and regulatory requirements
- safety and environmental systems and performance
- the quality and integrity of the organisation's financial reporting
- the qualification and independence of the external auditors
- the scope and effectiveness of the external audit function
- the effectiveness of the organisation's internal controls and internal audit function

The role, purpose and responsibilities of the RAC are set out in the RAC Charter. This Charter can be viewed through the ANSTO web site at www.ansto.gov.au.

The Board is responsible for the appointment of committee members. Membership of the RAC consists of at least three members drawn from the Board, plus an independent member with specific accounting and financial management expertise.

The Chair of the ANSTO Board, the Chief Executive Officer, Chief Finance Officer, the Senior Manager, Governance, Risk, Compliance and Assurance (who holds the position of Head of Internal Audit) and representatives from ANSTO management are not members of the committee, but may attend all or part of each RAC meeting as observers, by invitation of the committee chair.

Representatives from the Australian National Audit Office (ANAO) and their contracted service provider (currently

Table 1

Member	Eligible to attend	Attended
Dr Paul Greenfield AO (Chairman)	6	5
Professor David Copolov OAM	6	6
Ms Christine McLoughlin	4	4
Dr Susan Pond AM	6	6
Professor Judy A Raper	6	6
Mr John Ryan PSM	6	6
Ms Erica Smyth	5	5
Professor Andrew M Scott	6	6
Dr Adrian Paterson (Chief Executive Officer)	6	6

Deloitte) also attend each RAC meeting, by invitation of the committee chair.

Critically, from a governance perspective the RAC:

- considers the organisation's compliance with regulatory obligations; in particular those imposed on the organisation by its regulators (ARPANSA, Australian Safeguards and Non-Proliferation Office (ASNO), Comcare and Therapeutic Goods Administration (TGA)), and obtains assurances from management that appropriate controls are in place to ensure compliance
- meets the organisation's external and internal auditors and executive management regularly to consider key risks which may influence the achievement of the organisation's objectives, reviews the audit plans prepared by external and internal auditors, and reviews accounting, auditing, financial reporting, corporate governance and compliance matters
- assesses the independence of the external auditor and approves the external auditor's annual Engagement Letter
- assesses the performance of the internal audit function, approves the Internal Audit Charter and annual work plan and reviews all Internal Audit reports

The Risk and Audit Committee meets four times a year, and includes an annual Risk Workshop. Details of the number of RAC meetings attended by each member during the financial year 2012-13 are provided in **Table 2.**

Remuneration Committee

The overall purpose of the Remuneration Committee is to

- review and monitor the overall remuneration policies and practices of ANSTO
- recommend to the Board adjustments to the Chief Executive's remuneration package
- consult with the Chief Executive Officer in the setting of remuneration packages for senior ANSTO executives
- consider any other matter referred to the committee by the Board

The role, purpose and responsibilities of the committee are set out in the Remuneration Committee Charter. This Charter can be viewed through the ANSTO web site at www.ansto.gov.au

Remuneration Committee members for the period 2012-13 were: Dr Paul Greenfield (Chairman) and Dr Susan Pond. The Chief Executive Officer and other ANSTO senior personnel attend committee meetings or relevant parts by invitation of the committee chair.

The committee did not meet during the 2012-13 financial year.

External Audit

Under Section 8 of the CAC Act, the Commonwealth Auditor-General, through the ANAO, is the external auditor for ANSTO. For the year 2012-13, the ANAO contracted with Deloitte Australia to undertake the ANSTO external audit. In accordance with auditing standards, Deloitte Australia is only able to provide ANSTO with external audit services.

Table 2

Member	Eligible to attend	Attended
Mr John Ryan PSM	4	4
Ms Christine McLoughlin (1 July 2012 to 12 March 2013)	3	3
Professor David Copolov OAM	4	4
Dr Susan Pond AM	4	4
Professor Judy A Raper	4	4
Professor Andrew M Scott	4	4
Ms Erica Smyth	3	3
Mr Warren Wilton (External Representative) (1 July 2012 to 25 November 2012)	2	2

Risk management

The Board is responsible for the governance of ANSTO's strategic and operational risks through formal processes, which include the development and implementation of dedicated policies and plans for a systematic and disciplined approach to evaluate and improve the effectiveness of ANSTO's risk management, internal control, compliance, governance and assurance processes.

Management is accountable to the Board for designing, implementing and monitoring the system and process of risk management and integrating it into the day-to-day activities of the organisation.

The Board recognises that developing and implementing ANSTO's risk management and related strategies require careful consideration and a balancing of both risk and opportunity. In this regard, the Board ensures that it understands the implications of risks taken by management, as well as the potential impact of risk-taking on the organisation's stakeholders.

The Board regularly receives and reviews a register of the organisation's key risks and ensures that particular attention is focused on those risks that may negatively impact the sustainability and reputation of the organisation. The Board also receives regular assurance reports and briefings regarding the implementation of the risk management plan and the risk management maturity of the organisation.

ANSTO's enterprise-wide risk management process pursues the following principal objectives:

- to ensure that significant business risks are systematically identified, analysed and managed to acceptable levels based on risk appetite levels as approved by the Board
- to achieve an optimal risk-reward balance
- to ensure that risk management is embedded in all decision making processes, including planning, projects, operations and disposals
- The organisation's enterprise-wide risk management process is guided by the following key principles:
- clear assignment of responsibilities and accountabilities
- a common enterprise-wide risk management framework
- a set of enabling risk management capabilities through measurement, standardisation of risk management

processes and systems, a common risk language and risk management training

- the identification of uncertain future events that may influence the achievement of business plans and organisational objectives
- the integration of risk management activities within the organisation and across its value chains

ANSTO's integrated risk management approach entails the determination and development of risk profiles at organisational, divisional, functional and process levels. In this context, risks are considered at:

- organisational level through the management of strategic risks that may impact the organisation's ability to achieve its strategic objectives on a sustainable basis
- divisional and functional levels in achieving objectives that are closely aligned to the ANSTO group strategy
- process level to include the management of operational, financial, project, compliance and legal risks that may have an impact on people and the environment

Business Resilience

Continuity of ANSTO's operations is critical and is a key focus area that has been considered and planned for by the Board, the Chief Executive Officer and senior management. Many services delivered by ANSTO are critical to the economic, social well-being and health of the Australian community.

ANSTO regularly reviews and tests all aspects of its Business Resilience Framework to ensure its continued robustness, reliability and readiness. This includes response planning in relation to ANSTO's OPAL reactor and other critical infrastructure.

Regulatory and Legal Compliance

ANSTO operates within a complex and highly regulated business environment. ANSTO has established and continues to improve and strengthen a comprehensive range of strategies, policies, systems, responsibility and accountability arrangements that mitigate the risk of non-compliance to relevant laws and regulations.

A key initiative for 2012-13, that over time will significantly enhance ANSTO's compliance framework, has been the establishment of a dedicated Governance, Risk, Compliance and Assurance (GRCA) Group within the Office of the Chief Executive Officer.

In the year 2012-13, particular attention has been given to increasing ANSTO's compliance management capacity and to review and update its Legal and Regulatory obligations database and to evaluate and improve related compliance strategies.

The Board through the RAC monitors the implementation and improvement of ANSTO's legal and regulatory compliance framework.

Business Ethics and Fraud Control

The ANSTO Board and Chief Executive Officer have approved a Code of Ethics for ANSTO that provides all ANSTO employees and contracted staff with a framework for ethical decision-making and which articulates the standards of behaviour, values and actions expected of all individuals who work for ANSTO. The Code explains the principles covering appropriate conduct in a variety of contexts and how employees are to deal with their work colleagues, stakeholders, other organisations and the community.

The Code of Ethics can be viewed through the ANSTO web site at www.ansto.gov.au

The Code is supported by a range of policies, guidelines and instructions that

specifically address matters canvassed within the Code. These guides address matters such as: Managing Conflicts of Interest; Harassment and Bullying; Gifts and Benefits; Hospitality; Insider Trading; Email and Internet usage, etc.

ANSTO's ethical values and standards are reinforced through induction training of new employees; training / awareness courses and programs for managers and staff (that includes targeted 'protective security' training); staff engagement surveys; and through the ANSTO Enterprise Agreement.

Oversight of ANSTO's ethics programs and strategies is through the GRCA Group within the Office of the Chief Executive Officer.

The Australian Government, through the Commonwealth Fraud Control Guidelines (CFCG) 2011 and Ministerial direction issued pursuant to section 28 of the CAC Act, places a legal obligation on ANSTO to establish a comprehensive fraud and corruption prevention program.

The CFCG articulate the government's expectations for the implementation of effective fraud control measures by Commonwealth agencies. Principal amongst these expectations is the obligation placed on the ANSTO Board to be satisfied that ANSTO complies with the mandatory requirements of the guidelines, most notably the:

- conduct of fraud risk assessments
- development and maintenance of a fraud control policy and plan
- development and fostering of ethical conduct standards
- implementation of fraud / ethics training and awareness programs
- establishment of appropriate systems to detect fraud, particularly in areas of high risk
- establishment and operation of appropriate channels for reporting suspected fraud
- establishment and operation of appropriate systems to assess, investigate and determine reported incidents of alleged or suspected fraud (including the adoption of appropriate 'Investigation Standards')
- referral of matters to law enforcement agencies

In accordance with our obligations under the CFCG, ANSTO conducts risk assessments of its exposure to possible fraud, corrupt conduct and other forms of unacceptable behaviour, and has prepared a comprehensive Fraud Control Plan that details fraud control governance arrangements and risk mitigation strategies.

ANSTO has also established specific fraud control and ethics policies, standards and procedures that serve to minimise the incidence of fraud and other forms of unacceptable behaviour. This includes procedures and processes for fraud prevention, detection, reporting (including 'Hotline' and 'Whistle-blower' reporting) and investigation standards.

Internal Audit

The ANSTO Board has established an Internal Audit function as a key component of ANSTO's governance framework.

The primary purpose of the Internal Audit function is to provide the ANSTO Board and Chief Executive Officer with independent and objective assurance and advisory services that 'add value' and which help improve operational performance.

The scope of the Internal Audit function encompasses all financial and non-financial functions, systems, programs, projects, activities and processes, across all ANSTO Institutes, Divisions, and Business Units. Internal Audit engagements generally involve:

- appraising the adequacy and effectiveness of the internal control environment

- reviewing the adequacy and effectiveness of arrangements established by management to ensure compliance
- assessing the adequacy of risk management activities as they relate to specific business functions, systems, programs, projects or activities
- reviewing the means of safeguarding physical and intangible assets
- reviewing the reliability and integrity of financial and non-financial information
- appraising the economy, efficiency and effectiveness with which resources are acquired and deployed relative to the achievement of business objectives

The Head of Internal Audit prepares strategic and annual work plans that are risk based, and which reflect focus areas that may be highlighted by the RAC and executive management. These plans are updated, as appropriate, in line with ANSTO's dynamic business environment. The annual Internal Audit plan is approved by the RAC.

A comprehensive report on internal audit findings and recommendations is presented to the RAC. Follow-up reviews are conducted to ensure the proper close-out of all internal audit recommendations.

To ensure the independence of the Internal Audit function, the Head of Internal Audit reports directly to the RAC and has unrestricted access to the Chair and members of the committee, as well as the Chair of the Board. The Head of Internal Audit reports administratively to the Chief Executive Officer.

The Head of Internal Audit attends executive management meetings and also has unfettered access to Board and committee minutes and submissions.

The role, purpose, scope and authority of the Internal Audit function are set out in the Internal Audit Charter. This Charter, which is reviewed and approved by the RAC, can be viewed through the ANSTO web site at www.ansto.gov.au

Internal Control and 'Combined' Assurance

The Board is ultimately responsible for the system of internal control, designed to provide reasonable assurance regarding the achievement of business objectives in relation to the effectiveness and efficiency of ANSTO's operations, the reliability of financial reporting and compliance with applicable laws and regulations.

ANSTO, through the newly established GRCA Group within the Office of the Chief Executive Officer, is developing a combined assurance model that will identify, describe and map all groups, persons and functions, both internal and external to ANSTO, that provide assurance that ANSTO's functions, operations, systems and processes are being managed in a controlled, compliant, efficient and effective manner.

This assurance landscape mapping process is designed to provide the RAC and executive management with greater insight into functions and activities across ANSTO's operations where the potential for failure of internal controls could give rise to 'material' strategic, operational or compliance risk, and to understand the depth and breadth of assurance arrangements over such functions and activities.

The resulting analysis will be used to:

- identify gaps in assurance coverage and duplication of assurance effort
- help assess, improve and report (to the Board) the overall effectiveness of ANSTO's Internal Control environment

- inform the ongoing development of ANSTO's Governance, Risk, Compliance, Business Ethics and Combined Assurance frameworks
- assist in the framing of future Internal Audit plans and engagements

Judicial decisions and reviews by outside bodies

There were no judicial decisions or decisions of administrative tribunals that had a significant impact on the operations of ANSTO during the reporting year.

There were no specific reports issued by the Commonwealth Auditor-General, other than their report issued in relation to the 2012-13 financial statements.

There were no reports on the operations of ANSTO by a Parliamentary Committee, the Commonwealth Ombudsman or the Office of the Australian Information Commissioner during the reporting year.

Indemnities and insurance premiums for officers

ANSTO's insurance coverage with Comcover includes professional indemnity and directors' and officers' liability. Certain sections of the CAC Act contain prohibitions against ANSTO giving indemnities and paying insurance premiums relating to liabilities arising from conduct involving a lack of good faith by officers. There have been no exceptions to these provisions and no claims were made against ANSTO in respect of such liability that required a claim on ANSTO's insurer, Comcover.

It should be noted that ANSTO subsidiaries are fully covered under ANSTO's overarching Comcover policies. Workers Compensation coverage is however, dependent on whether employees of a subsidiary are Commonwealth Government employees or employed under State labour legislation. Steps have been taken during the incorporation of Synchrotron Light Source Australia Pty Ltd to ensure that the entity is within the scope of ANSTO's policies for 2012-13.

APPENDIX 1

Equality of Employment Opportunity

ANSTO's 2012-2014 Certified Enterprise Agreement reaffirmed the organisation's commitment to:

1. Supporting staff achieve a balance in their work and personal life including reviewed working from home and phased retirement provisions.
2. Providing a positive working environment through preventing and eliminating workplace bullying and harassment; and
3. Recognising the value of diversity in the workplace and making all reasonable endeavours to improve diversity of ANSTO's workforce, including Aboriginal Torres Strait Islander employees, employees with a disability and employees from a culturally and linguistically diverse background.

The Enterprise Agreement also contains extended maternity leave and paid paternity leave entitlements.

Family services and Childcare Centre

Construction of ANSTO's childcare centre continued throughout 2012-13 and is set to open in September 2013.

Although open to the wider community, the centre gives priority to ANSTO staff and its subsidiaries who have the ability to salary package the centres fees.

The centre will be operated and managed by KU Children's Services and will provide places for 48 children aged from 0-6 years old.

Equality of employment opportunity for 2012-13			
	Number employed	% of total staff	Average salary
Female	338	29%	$ 74,029.30
Male	828	71%	$ 93,992.74
People with disabilities	9	1%	$ 70,875.00
Aboriginal and Torres Strait Islander	10	1%	$ 82,994.50
Non-english speaking background	351	30%	$ 92,627.10

APPENDIX 2

Functions and powers of the organisation under the *ANSTO Act*

This appendix describes the functions and powers of the organisation under the *Australian Nuclear Science and Technology Organisation Act 1987* (ANSTO Act), which is ANSTO's enabling legislation. In the text below, 'Organisation' means the Australian Nuclear Science and Technology Organisation.

Section 5: Functions of the Organisation

(1) The functions of the Organisation are:

(a) to undertake research and development in relation to:

(i) nuclear science and nuclear technology; and

(ia) the application and use of nuclear science and nuclear technology; and

(ii) the production and use of radioisotopes, and the use of isotopic techniques and nuclear radiation, for medicine, science, industry, commerce and agriculture; and

(iii) such other matters as the Minister directs; and

(b) to encourage and facilitate the application and use of the results of such research and development; and

(ba) to condition, manage and store radioactive materials and radioactive waste, arising from:

(i) the Organisation's activities (including the production of radioactive materials for other persons); or

(ii) the activities of companies in which the Organisation holds a controlling interest (including the production of radioactive materials for other persons); or

(iii) the use by other persons of radioactive materials produced by the Organisation or such companies; or

(iv) the activities of other persons who are specified in the regulations; and

(bb) to condition, manage and store radioactive materials and radioactive waste generated, possessed or controlled by the Commonwealth or a Commonwealth entity; and

(bc) to condition, manage and store radioactive materials and radioactive waste at the request of:

(i) a law enforcement agency; or

(ii) a Commonwealth, State or Territory agency responsible for the management of emergencies or disasters; including, but not limited to, radioactive materials or radioactive waste involved in, or arising out of, a radiological incident or a radiological emergency; and

(bd) to condition, manage and store radioactive waste that has been, or is to be, sent to Australia under contractual arrangements relating to the conditioning or reprocessing of ANSTO spent nuclear fuel; and

APPENDIX 2

Functions and powers of the organisation under the *ANSTO Act*

(c) to produce, acquire, provide and sell goods, and to provide services, that are:

(i) in connection with the production and use of radioisotopes, and the use of isotopic techniques and nuclear radiation, for medicine, science, industry, commerce and agriculture; or

(ia) in connection with the conditioning, management and storage of radioactive materials or radioactive waste; or

(ib) in connection with nuclear science and nuclear technology; or

(ic) in connection with the application and use of nuclear science and nuclear technology; or

(ii) otherwise in connection with matters related to its activities; and

(d) to act as a means of liaison between Australia and other countries in matters related to its activities; and

(e) to provide advice on aspects of:

(i) nuclear science and nuclear technology; and

(ii) the application and use of nuclear science and nuclear technology; and

(iii) other matters related to its activities; and

(ea) to make available to other persons, on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Organisation by:

(i) providing training and management expertise; or

(ii) selling or leasing equipment; or

(iii) leasing land, buildings and facilities; or

(iv) taking any other action that the Organisation thinks appropriate; and

(f) to cooperate with appropriate authorities of the Commonwealth, the States and the Territories, and with other organisations and institutions in Australia or elsewhere, in matters related to its activities; and

(g) to publish scientific and technical reports, periodicals and papers on matters related to its activities; and

(h) to collect and sell or distribute, as appropriate, information and advice on matters related to its activities; and

(j) to arrange for training, and the establishment and award of scientific research studentships and fellowships, in matters related to its activities; and

(k) to make grants in aid of research into matters related to its activities; and

(m) to make arrangements with universities and other educational research institutions, professional bodies and other persons for the conduct of research or of other activities in matters related to its activities.

APPENDIX 2

Functions and powers of the organisation under the *ANSTO Act*

(1A) A regulation made for the purposes of subparagraph (1)(ba)(iv) must not have the effect of authorising the premises on which the Lucas Heights Research Laboratories are situated to become a national nuclear waste repository.

(1B) In subsection (1A):

national nuclear waste repository means a site chosen by the Commonwealth, after the commencement of this subsection, for the storage of nuclear waste with a view to it never being moved to another site.

(1C) Without limiting paragraph 5(1)(bb):

(a) radioactive materials and radioactive waste generated by a Commonwealth contractor under a contract between the Commonwealth contractor and the Commonwealth or a Commonwealth entity are taken to be generated by the Commonwealth or the Commonwealth entity, as the case requires; and

(b) radioactive materials and radioactive waste possessed or controlled by a Commonwealth contractor under a contract between the Commonwealth contractor and the Commonwealth or a Commonwealth entity are taken to be possessed or controlled by the Commonwealth or the Commonwealth entity, as the case requires.

(2) The Organisation shall not undertake research or development into the design or production of nuclear weapons or other nuclear explosive devices.

(3) In undertaking its functions, the Organisation is to have regard to:

(a) the Commonwealth Government's national science, technology and energy policy objectives; and

(b) the Commonwealth Government's commercialisation objectives for public research institutions.

(4) The Minister shall not give a direction under subparagraph (1)(a)(iii) to the Organisation to undertake research or development in relation to a matter unless the Minister is satisfied that research or development by the Organisation in relation to that matter would be an effective use of the staff of the Organisation, and would not duplicate unnecessarily any activity being carried on, or proposed to be carried on, by any other agency or authority of the Commonwealth.

(5) The Organisation may perform its functions to the extent only that they are not in excess of the functions that may be conferred on it by virtue of any of the legislative powers of the Parliament, and, in particular, may perform its functions:

(a) in so far as it is appropriate for those functions to be performed by the Organisation on behalf of the Government of the Commonwealth as the national Government of Australia; and

(b) for purposes for which it is appropriate for the Parliament as the national Parliament of Australia to authorise the Organisation to perform functions; and

(c) by way of expenditure of money that is available for the purposes of the Organisation in accordance with an appropriation made by the Parliament; and

APPENDIX 2

Functions and powers of the organisation under the *ANSTO Act*

(d) in the course of, or in relation to, trade and commerce with other countries, among the States, between Territories or between a Territory and a State; and

(e) for purposes related to external affairs; and

(f) for purposes in or in relation to a Territory; and

(g) for purposes related to the defence of the Commonwealth.

Section 6: General powers of Organisation

(1) Subject to this Act, the Organisation has power to do all things necessary or convenient to be done for or in connection with the performance of its functions and, in particular, has power:

(a) to enter into contracts;

(b) to acquire, hold and dispose of real or personal property;

(c) to occupy, use and control any land or building owned or held under lease by the Commonwealth and made available for the purposes of the Organisation;

(d) to erect buildings and structures and carry out works;

(e) to form, or participate in the formation of, a company or partnership;

(f) to appoint agents and attorneys, and to act as an agent for other persons;

(g) to engage persons to perform services for the Organisation;

(h) to design, produce, construct and operate equipment and facilities; and

(j) to do anything incidental to any of its powers.

(2) The powers of the Organisation may be exercised within or outside Australia.

(3) To avoid doubt, the Organisation has the power to construct buildings and facilities for the sole purpose of performing the function referred to in paragraph 5(1)(ea).

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

Environmental Protection

ANSTO's commitment to environmental protection and sustainability principles is defined in its WHSE Policy and Corporate strategic plans which inform its social, economic and environmental core values. These priorities are integral to ANSTO's Business Management System – the framework that defines how business is conducted to deliver outcomes to our customers and stakeholders in a safe, consistent and environmentally responsible manner. Targets and objectives for protecting human health, safeguarding our operations and minimising our environmental footprint derive from these overarching documents and are managed through documented operational and business plans.

Environmental protection is formally considered when funding, planning and undertaking major capital works and any proposed radiation facilities are assessed for referral to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) under the EPBC Act. Three such referrals were made during the period, however SEWPaC officers deemed that none were controlled actions and therefore they did not require further assessment or approval. Proposals for new (or modifications to existing) facilities or processes also undergo a rigorous internal safety, regulatory and environmental assurance process.

Environmental awareness is promoted throughout the organisation through site inductions, training and communication programs.

Environmental management system

To provide assurance that ANSTO is maintaining sound environmental protection practices, we maintain an environmental management system (EMS) that is certified to the International Standard ISO 14001. This standard requires that environmental risks and legal requirements are understood, managed and mitigated; an effective measurement and review system is in operation; and that there is an organisational commitment to continual improvement. In addition, all parts of our environmental monitoring program operate within a quality system certified to the ISO 9001:2000 standard for Quality Management Systems.

ANSTO developed a 5-year Environmental Management Strategy which was endorsed by the Board in August 2013. To support the implementation of this strategy, the title and charter of the Executive Safety Sub-Committee was amended to include oversight of the environmental management system. It is now known as the Executive Committee: Workplace Health Safety and Environment.

Environmental performance indicators

ANSTO is reducing its environmental footprint by minimising waste and the consumption of resources such as fuel, electricity and water, and by recycling consumables.

The performance indicators below show that power and water consumption decreased slightly in 2012-13 (due to the OPAL major shutdown) and 3% more waste was sent to landfill from construction and demolition works. The volume of waste water discharged to sewer decreased significantly and recycling increased by 70% overall, which was mainly due to the improvement in uptake of paper recycling.

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

Resource Usage	Units	2010-11	2011-12	2012-13	% Difference
Electricity	GWh	37.12	37.95	35.41	-6.7%
Water	m^3	280,086	283,090	277,803	-1.9%
Waste Disposal					
Waste sent to landfill	tonnes	307.5	268.6	277.6	3.3%
Liquid effluent discharged to sewer	m^3	111,055	118,421	101,449	-14.3%
Recycled Waste					
Cardboard	tonnes	20.2	21.2	21.3	0.5%
Co-mingled containers	tonnes	4.17	7.0	7.65	9.3%
Paper	tonnes	No data	12.54	21.24	69.4%

Environmental monitoring program

Besides recycling paper, cardboard and co-mingled containers, ANSTO also recycles metals, garden waste, concrete, batteries, toner cartridges, mobile phones and old computer equipment however, statistics for these items are not consistently available.

Environmental events

All safety and environmental incidents are reported, investigated and actioned via ANSTO's Event Reporting system. Thirteen minor and one major environmental event were reported during the year. The major event was a leak (detected in March by ANSTO staff) in the discharge pipeline which carries treated wastewater and sewage from the Lucas Heights site to the Sydney Water sewer at Engadine, in a section where it crosses the Woronora River. The discharge system was immediately shut down to stop further wastewater being released into the river. The rupture occurred due to corrosion of the 50 year old concrete-encased underwater pipe. ANSTO promptly instigated repair works and informed regulators, staff and other key stakeholders and issued updates via the staff intranet, ANSTO website and media statements. Extensive sampling and testing of water samples from the Woronora River was conducted at locations close to the leak and further downstream, with no radioactive material detected. Bacterial testing was also undertaken at a downstream public swimming hole and results for these water samples confirm that there was no radiological impact on the Woronora River or on public health. The pipeline was repaired and returned to service on 19 March.

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

Environmental monitoring program

ANSTO conducts an extensive environmental monitoring program that measures radioactivity in authorised emissions to air and liquid effluent discharges to the sewer; and in samples of air, surface water, ground water, sediment and biota from the local environment. Local environmental radiation and weather conditions are reported online via the ANSTO webpage. Many of the monitoring results are independently verified.

Results of environmental monitoring in 2012-13 demonstrate that ANSTO's authorised releases of radioactive material to the air and sewer were effectively controlled, complied with regulatory limits and had minimal impact on humans or the environment.

Liquid effluent discharges within limits

Effluent discharged from ANSTO into the sewer complied with limits for radioactive discharges in accordance with the Trade Waste Agreement with Sydney Water Corporation. Compliance with these limits, together with annual effluent dilution studies, ensures that water at the Cronulla wastewater treatment plant meets World Health Organisation drinking water standards for radioactivity.

A total of 101449 m^3 of waste water (trade waste and sewage) was treated, tested and discharged to the sewer. Concentration limits for nonradioactive materials such as ammonia, zinc and total dissolved solids were also met. Sydney Water conducts independent testing of liquid effluent discharges to sewer and the Trade Waste Agreement is periodically reviewed to provide assurance that ANSTO's discharges remain within authorised limits and pose no threat to the environment. Effluent from the Sutherland Shire undergoes tertiary treatment at the Cronulla wastewater treatment plant and is ultimately discharged to the ocean at Potter Point. Analysis of marine biota (fish, seaweed and barnacles) growing at Potter Point confirmed that ANSTO's discharges are not detectable the local marine environment.

Compliance with airborne discharge authorisation

Air ventilated from laboratories and facilities working with radioactive materials is treated and/or filtered prior to discharge and continuously monitored at 18 locations. ARPANSA sets limits for airborne radioactive discharges from ANSTO facilities and whilst some periodic regulatory notification levels were exceeded for xenon-133 discharges, all such emissions were within the annual operating compliance limits in 2012-13.

Public doses low

Computer modelling is used to estimate the potential radiation dose to people from operations at the Lucas Heights site. The model inputs include actual stack discharges, local weather data and conservative assumptions about environmental pathways and food consumption.

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

The maximum potential dose to local residents from ANSTO's airborne emissions in 2012-13 was 0.002 mSv. This is 0.2 per cent of the annual public dose limit of 1 mSv established by ARPANSA. Doses from ANSTO's airborne emissions in 2012-13 remain well below the 0.02 mSv performance objective, despite increased production of beneficial medical isotopes (see Figure 1).

Studies previously carried out for the environment at Potter Point have confirmed that the radiological risk to humans and marine life from ANSTO's liquid effluent discharges is negligible.

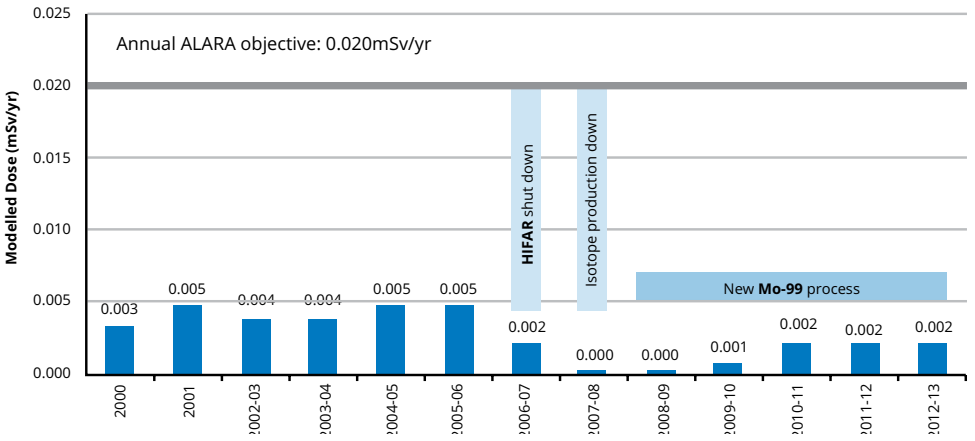

Figure 1: Maximum annual effective dose from LHSTC airborne discharges at the 1.6 km boundary of ANSTO's buffer zone.

For its closest neighbours, ANSTO's activities added less than 0.2 per cent to the 1.5 mSv dose that every Australian receives from natural background radiation each year, as shown in Figure 2.

Average Annual dose

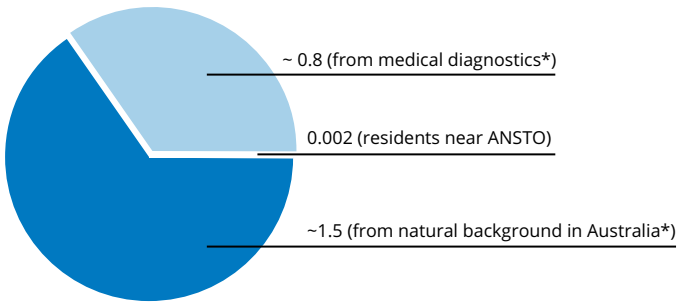

Figure 2: Average annual doses received by Australians from various sources compared to the maximum potential airborne dose to ANSTO local residents in 2012-13.

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

Good water quality

Stormwater runoff from the Lucas Heights site does not contribute to any public drinking water supply, however ANSTO regularly monitors stormwater leaving the site, as well as sampling the nearby Woronora River. Results show that concentrations of tritium in water in the local environment have decreased since the HIFAR reactor closed in January 2007, and are well below the level considered safe for Australian drinking water. Gross alpha and beta measurements were also below the levels required for surface waters under the previous NSW *Protection of the Environment Operations Act 1997*. In fact, most measurements were below the stricter levels of the Australian Drinking Water Guidelines.

There is an extensive network of shallow and deep monitoring wells designed to monitor potential sources of contamination to groundwater, as well as water quality and groundwater movement. Groundwater from the Lucas Heights site contained low levels of tritium (ranging from <1.8 to 41.2 Bq/L) and naturally-occurring radionuclides; and no hydrocarbons were detected in groundwater near underground fuel storage tanks.

Detailed reporting

Reports on airborne and liquid effluent discharges are submitted to the relevant regulatory authorities on a quarterly basis. Results and findings from our environmental monitoring program are available to the public on the ANSTO website. In addition, ANSTO reports environmental radiation dose-rates recorded in the nearby suburb of Engadine via the ANSTO webpage, which is the only on-line station of its type in Australia. The Lucas Heights weather data are also available on ANSTO's website.

ANSTO reports annually to the Energy Efficiency in Government Operations (EEGO) and National Greenhouse and Energy Reporting (NGER) programs, also to the Department of Sustainability, Environment, Water, Population and Communities about any of its activities that fall under the National Environmental Protection Measures. Overall, ANSTO commits significant resources to effectively monitor, manage and report on its environmental impacts and responsibilities.

Ecologically sustainable development (ESD)

ANSTO integrates ESD principles into management processes by including environmental risk assessments at the project planning phase. Major capital projects include environmental impact statements and environmental protection plans. ANSTO have implemented an improved building code with minimum 4.5 star NABERS rating for new and renovated office accommodation, to improve the energy and water efficiency of buildings and have installed numerous water tanks for collection of rainwater. The ANSTO building code will guide the sustainable development of the campus into the future.

ANSTO activities that contribute to ESD include our research into significant environmental issues such as air quality, natural water systems and water resource management, wetland health, climate variability, and global warming impacts such as rising sea levels and temperatures. This research provides practical, science-based advice to inform decision makers, creating opportunities to conserve resources and sustain our fragile environment.

APPENDIX 3

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), section 516A

We monitor our carbon footprint and participate in the Sustainability Advantage Program run by the NSW Office of Environment and Heritage.

ANSTO encourages staff to cycle, carpool or take public transport to get to work and to walk rather than drive around the site. ANSTO provides staff with a carpooling website and mini-bus services between our site and local railway stations. Extra footpaths have been installed and ANSTO has numerous bike racks, showers and lockers for use by the avid walker/cyclist.

The ANSTO online 'swap shop' provides a place for staff to pass on unwanted goods or find goods they are seeking. From furniture to chemicals to analytical equipment, by exchanging useful products staff can help save time, money and most importantly, the environment by reducing waste going to landfill.

The ANSTO Content Server project is facilitating the move to paperless offices by providing a secure platform for electronic document control and storage, which will reduce demand for, and increase recycling of, paper hardcopy records.

By utilising our assets and infrastructure more effectively, we will increase scientific productivity thereby enhancing the environmental sustainability of our operations. To this end, ANSTO has invested in the development of an electronic Equipment Database tool.

ANSTO's support of nuclear non-proliferation ideals and the development of nuclear safeguards through its collaborative research with bodies such as the International Atomic Energy Agency and the Comprehensive Test Ban Treaty Organisation, also accords with ecologically sustainable development (ESD) principles.

Finally, ANSTO's commitment to sound environmental management and ESD means that special emphasis is placed on reducing our environmental footprint by minimising waste and the consumption of resources and by recycling consumables. It also ensures that we manage our past and current waste in a manner that protects human health and the environment, now and in the future.

***Reference for figure 2:**

Webb, D., Solomon S., Thomson J., 1999. Background radiation and medical exposure levels in Australia. Radiation protection in Australasia, Volume 16(1), whole issue.

APPENDIX 4

Work Health and Safety Act 2011

ANSTO has taken a proactive approach to managing the musculoskeletal stress risks by engaging a physiotherapist provider to target these risks. By providing functional testing as part of our pre-employment assessments for roles involving hazardous manual tasks and engagement in targeted conditioning program for hazardous manual tasks ANSTO has minimised the risk of these types of injuries

Safety commitment

ANSTO is committed to ensuring a safe and healthy work environment for employees, visitors, contractors and the community. ANSTO strives, through a process of continuous improvement, to fully integrate safety, health, and environment into all aspects of its activities.

Safety and environmental principles, values and commitments are set out in the ANSTO Work Health and Safety and Environment Policy which is supported by a framework of documents that constitutes our Work, Health and Safety management system. Key elements of the safety system are:

- documented requirements and guidance
- formal review and approval of potentially hazardous work
- auditing and evaluation of safety performance
- communication of safety issues and performance to employees, contractors and the community
- encouraging reporting and an open empowered approach to talking about safety and safety behaviours.

In 2012-13 ANSTO undertook a fundamental review and update of its safety management system to meet the requirements of the new Work, Health and Safety (WHS) legislation.

Accidents and incidents

An important part of ANSTO's safety management system is the capturing of information on all safety-related events including accidents and 'near hits'. This ensures the proper investigation of all such events and the implementation of safety improvements. It also provides data to drive improvements in ANSTO's safety performance.

One key indicator of ANSTO's safety performance is its lost time injury frequency rate (LTIFR). In 2012-13 ANSTO recorded its lowest LTIFR in six years at 0.46; this is compared to the 2011-12 figure of 2.6. The main drivers behind this improvement have been our early intervention program, our return to work program and the engagement of an occupational injury management provider which ensured that injuries were managed in a timely manner. Although the trend remains downward, ANSTO continues to focus on meeting our stated objective of Zero Harm to our workers.

Another key indicator of safety performance is the number of Opportunities For Improvement (OFIs) reported which are regarded as an essential component of a robust safety culture and key driver for continuous safety improvement. 2012-13 saw a continued

focus on increased event reporting, focussed investigation and completion of arising actions, with a continued increase in reported OFIs.

ANSTO also works with its regulators to improve Work Health and Safety (WHS) across the site. In 2012-13 ANSTO informed Comcare of 9 notifiable incidents.

Accidents and incidents

The following initiatives contributed to ANSTO's commitment to the health and safety of its workers, including contractors and visitors:

- improved WHS induction processes
- continued to worked with contract partners to ensure construction is carried out safely
- a continued emphasis on ANSTO having a 'reporting culture' whereby incidents, near hits and hazards reporting is encouraged
- initiation of a detailed hazard register to include all identified legacy hazards.
- bimonthly safety focus linked with other Health and Safety initiatives and incident trending
- the modification and replacement of electrical switchboards to meet the requirements of the Work Health and Safety regulations
- revised protocol for the handover of new facilities at the completion of construction projects, to ensure that all compliance related requirements are in place and that facilities are safe to occupy and operate.

ANSTO continues to implement the 2010-2015 Safety Strategy with sixteen identified actions now completed. Improvements made include a risk based approach to maintenance tasks; development and implementation of a process for identifying key safety related aspects in building design and their control; establishment of a model for up skilling of staff in key safety areas through the workforce planning process.

The Executive Work, Health and Safety and Environment Committee continues to provide oversight and set direction on behalf of ANSTO Executive for safety and environment strategies, initiatives, events, processes, targets and reporting through the delegation of the CEO by:

- driving improvement programs through the analysis of safety and environmental data to determine key areas of focus
- reviewing and reporting progress against safety culture and environmental improvement programs
- providing management review of all actions required to fully meet institutional effectiveness in relation to ISO 14001 and OHSAS 18001
- monitoring progress of plans and performance against targets and identify any compliance gap closing actions
- ensuring ANSTO's effective regulatory compliance through oversight and annual review of a register of all applicable legislation and regulations pertaining to safety and the environment
- managing the investigation of major or severe safety or environmental events.

- ensuring that lessons learnt from events with the potential to affect the broader ANSTO community are applied effectively and in a timely manner
- issuing stop work directives in the event of being notified of a potential unsafe or hazardous condition.

The wellbeing of our workers is important to ANSTO with targeted initiatives including the Men's and Women's Health Programs, Bowel Screening and the Flu Vaccination Program.

Australian Radiation Protection and Nuclear Safety Regulations 1999, Statutory Rules 1999 No. 37 as amended.

Everyone in the world is exposed to ionising radiation from natural sources. People may also be exposed to radiation from non-natural sources, including nuclear medical procedures for diagnosis and treatment of certain illnesses. Personal radiation exposure ('dose') is measured in sieverts (Sv), however, typical annual exposures are so small that they are usually expressed in units of one thousandth of a sievert, known as a millisievert (mSv).

According to the most recent data from ARPANSA, the average dose an Australian receives from natural background radiation (excluding medical sources) is 1.5 mSv per year. Federal and state regulations require that a member of the public should receive no more than 1 mSv per year from radiation sources other than background radiation and medical procedures. The regulatory limit for radiation workers is 20 mSv per year, averaged over five years, with no more than 50 mSv in any one year.

This is derived from recommendations made by the International Commission on Radiation Protection (ICRP), that have specified three basic principles for radiation protection, which are applied at ANSTO:

1. All exposures to ionising radiation shall have a positive net benefit
2. All exposures shall be maintained as low as reasonably achievable (ALARA), accounting for social and economic factors
3. All exposures shall be less than the relevant statutory limit.

The application of these principles requires us to ensure that our occupational exposures are not just less than the statutory dose limit(s), but are as far below them as we can reasonably achieve. To this end ANSTO has imposed its own annual dose constraint of 15 mSv to any member of staff.

The radiation exposure of ANSTO's workers, who are routinely engaged in working with ionising radiation, is monitored by our specialist dosimetry service, with records of all exposures maintained. Monitoring results for 2012-13 show that the radiation doses received by ANSTO workers remain significantly below regulatory limits. In 2012-13 the average effective dose across all ANSTO workers was 0.4mSv.

APPENDIX 4

Work Health and Safety Act 2011

Table 1: Effective dose

Calendar Year					
Effective Dose	2008	2009	2010	2011	2012
Max. Individual Dose(mSv)	8.79	7.75	7.17	6.9	6.6
Average Dose All ANSTO Workers(mSv)	0.6	0.5	0.4	0.5	0.4
Collective Effective (mSv)	516.2	422	358.6	446.6	407.7

Table 1 shows the maximum, average and collective effective doses for the past five years. Collective effective dose is the total cumulative dose to an exposed group, in this case all ANSTO personnel registered with our radiation dosimetry service.

Table 2: Distribution of individual effective dose

Calendar Year					
Effective Dose Range	2008	2009	2010	2011	2012
0 to 0.99mSv	790	768	833	854	914
1 to 1.99mSv	45	37	22	66	32
2 to 4.99mSv	34	33	26	22	18
5 to 9.99mSv	11	7	7	5	4
>10mSv	0	0	0	0	0

Table 2 shows the distribution of individual effective doses over the same period. The graph in Figure 1 compares maximum effective dose to a single worker and the average effective dose across all relevant ANSTO workers.

Maximum Effective Individual Effective Dose and Average Effective Dose All ANSTO Workers

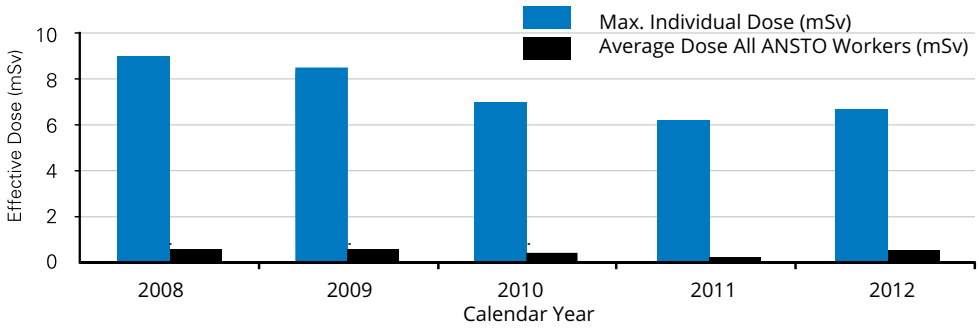

Figure 1: Comparison of Maximum and Average Effective Doses.
(effective dose), for the skin (shallow dose) and for extremities such as hands or feet. The respective dose limits are:
- whole body 20 mSv, averaged over five years
- shallow (skin) 500 mSv
- extremities 500 mSv.

Exposures to ANSTO workers for the last year have all been well below all statutory dose limits.

APPENDIX 5

Freedom of Information Act 1982, subsection 8

The Freedom of Information Act 1982 (FOI Act) provides the public with a general right of access to documents held by Australian Government agencies, by requiring agencies, such as ANSTO, to publish the information and provide a right of access to the documents.

This general right, is limited by exception, to protect essential public interests, including the privacy of individuals and the business affairs of those who give information to the agency.

In the reporting year to 30 June 2013, ANSTO has received 12 requests for information under the FOI Act.

ANSTO is required to publish information to the public as part of the Information Publication Scheme (IPS). The IPS is part of recent reforms to the FOI Act designed to promote open and transparent communication of government information.

Set out below is the information required to be published by ANSTO under Section 8 of the FOI Act.

1. **ANSTO's Agency Plan**

   ANSTO's Information Publication Scheme plan is currently available on the ANSTO website at www.ansto.gov.au/AboutANSTO/About. ANSTO is reviewing and updating this plan.

2. **Details of the structure of the Agency's organisation**

   An organisational chart detailing the structure of ANSTO can be found on ANSTO's website.

3. **Details of ANSTO's functions, including its decision making powers and other powers affecting members of the public**

   Information in relation to ANSTO's powers and functions can be found at pages 92-95 of this report and a link to this information including information about ANSTO's purpose, Board composition, Corporate Plan and Research and Service Charters can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

4. **Details of officer appointments at ANSTO**

   Details of officer appointments can be found at page 5 of this report and a link to this information can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

5. **ANSTO's Annual Report**

   A link to this annual report and annual reports of previous years can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

6. **Details of arrangements for members of the public to comment on specific policy proposal for which ANSTO is responsible**

   ANSTO regularly communicates with its stakeholders, which includes the local community and councils, relevant federal ministers and other government-related personnel, both state and federal, to ensure that they are kept up to date about what is happening at ANSTO. The community is kept informed of ANSTO's operations via the website which publishes news updates such as media releases. A link to this information can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

APPENDIX 5

Freedom of Information Act 1982, subsection 8

7. Information which ANSTO routinely gives access to in response to requests for access under the FOI Act (excluding documentations exempt from production under the FOI Act)

During 2012-13 there was no requested documentation falling within this category.

8. ANSTO's FOI Disclosure Log

The FOI Disclosure Log lists information which has been released in response to a FOI access request. The disclosure log requirement does not apply to:

- personal information about any person if publication of that information would be unreasonable
- information about the business, commercial, financial or professional affairs of any person if publication of that information would be 'unreasonable'
- other information covered by a determination made by the Australian Information Commissioner if publication of that information would be 'unreasonable'
- any information if it is not reasonably practicable to publish the information because of the extent of modification that would need to be made to delete the information listed in the above dot points.

A link to ANSTO's disclosure log can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

9. Information held by ANSTO which is provided to Parliament

A link to the information which ANSTO provides to parliament can be found on ANSTO's website at www.ansto.gov.au/AboutANSTO/About.

10. Contact details of ANSTO officers who can be contacted about access to information or documents under the FOI Act

Direct enquiries in relation to FOI process to the:

Mail:
FOI Coordinator
ANSTO
Locked Bag 2001
KIRRAWEE DC NSW 2232

Email:
foi@ansto.gov.au

Telephone:
+61 2 9717 3199 (FOI Coordinator)

These contact details can be found on ANSTO's website.

11. Operational information required under section 8 of the FOI Act, that is, information held by ANSTO to assist in the performance or exercise of ANSTO's functions or powers in making decisions or recommendations affecting members of the public

ANSTO has a range of publications, reports, information available for the public, including our annual reports, information on safety, research reports, educational books and leaflets, and DVDs. ANSTO also provides access to a searchable database of all of ANSTO's science publications, as well as an online archive for older publications.

APPENDIX 6

Index of compliance with reporting guidelines

Index of compliance with reporting guidelines under various Acts, Regulations and Orders applicable to ANSTO as a Commonwealth authority

ANSTO Act 1987

Functions and Powers	92-95

Commonwealth Authorities and Companies Orders (Financial statements for reporting periods ending on or after 30 June 2005) under the *Commonwealth Authorities and Companies Act 1997*

Financial statements and reports	39-80

Commonwealth Authorities (Annual Reporting) Orders 2011 under the *Commonwealth Authorities and Companies Act 1997*

Board members/information about directors (clause 13)	5, 81-90
Certification of report of operations (clause 6)	i
Disclosures requirements for Government Business Enterprises (clause 20)	N/A
Effects of ministerial directions (clause 12)	82
Enabling legislation (clause 10)	81
Summary of objectives and functions of legislation	92-95
Indemnities and insurance premiums for officers (clause 19)	90
Judicial decisions and reviews by outside bodies (clause 17)	90
Key activities and changes affecting the authority (clause 16)	82
Organisational structure and location of major activities and facilities (clause 14)	4, 117
Subsidiaries	61
Requirements under other guidelines and legislation (clause 12)	
Ecologically sustainable development and environmental performance	96-101
Equality of employment opportunity	91
Fraud control	87
Freedom of information	106-107
Work health and safety	102-105
Service charter	106
Responsible Minister (clause 11)	3, 82
Statement on governance (clause 14)	81-90

ACRONYMS

AAEC	Australian Atomic Energy Commission
ACAS	Australian Collaboration for Accelerator Science
AINSE	Australian Institute of Nuclear Science and Engineering
AM	Member of the Order of Australia
ANSTO	Australian Nuclear Science and Technology Organisation
ANM project	Australian Nuclear Medicine project
ANTARES	Australian National Tandem Research Accelerator
AO	Officer of the Order of Australia
AOFSRR	Asia Oceania Forum for Synchrotron Radiation Research
AONSA	Asia-Oceania Neutron Scattering Association
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASRP	Australian Synchrotron Research Programme
ATSE	Australian Academy of Technological Sciences and Engineering
BATAN	Indonesia's National Nuclear Energy Agency
CAC Act	Commonwealth Authorities and Companies Act 1997
CARR	China Advanced Research Reactor
CAS	Centre for Accelerator Science
CEA	French Commissariat à l'énergie atomique et aux énergies alternatives or French Atomic Energy Agency
CERN	European Organization for Nuclear Research
CFCG	Commonwealth Fraud Control Guidelines 2011
CIAE	China Institute of Atomic Energy
CRC-P	Cooperative Research Centre for Polymers
EIF	Education Investment Fund
FOI Act	The Freedom of Information Act 1982
GATRI	Gamma Technology Research Irradiator
GRCA	Governance, Risk, Compliance and Assurance
HIFAR	High Flux Australian Reactor
IAEA	International Atomic Energy Agency
J-PARC	Japan Proton Accelerator Research Complex
KEK	High Energy Accelerator Research Organisation
LEU	Low enriched uranium
Mo-99	Molybdenum-99
MOU	Memorandum of understanding
NBI2	Neutron Beam Instrument 2
NIF	National Imaging Facility
NTD silicon	Neutron transmutation doping silicon
NYSF	National Youth Science Forum
OAM	Medal of the Order of Australia
OPAL	Open Pool Australian Light-water research reactor
PET	Positron emission tomography
PSM	Public Service Medal
RAC	Risk and Audit Committee
RAM devices	Random Access Memory devices
RFID	Radio Frequency Identification
SAS2012	International Conference on Small-Angle Scattering
SINAP	Shanghai Institute of Applied Physics
SPECT	Single-photon emission computed tomography
SPECT/CT	Single-photon emission computed tomography/computed tomography
STAR	Small Tandem for Applied Research
USR	US Radiopharmaceuticals

INDEX

F

G

H

I

INDEX

CONTACT DETAILS

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Annual Report on the web
www.ansto.gov.au

Public information

ANSTO produces regular updates on its science and technology, has available a range of publications and conducts free tours of its site. For bookings, information or to get on our database, call +61 2 9717 3111 or email enquiries@ansto.gov.au

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Website
www.synchrotron.org.au

Cover images

Top-
The OPAL research reactor pool.

Bottom row left-
Michael Corry part of ANSTO's 2013 graduate program, preparing stack monitoring samples for environmental analysis.

Bottom row middle-
Emma Young, Environmental Monitoring Officer, taking water samples at the Woronora River, NSW.

Bottom row right-
ANSTO biologist, Nick Howell's research is contributing to better treatments for serious diseases such as Alzheimer's and Parkinson's.

Australian Government

ansto

Locations

Lucas Heights Campus

Camperdown Campus

Clayton Campus

Website

www.ansto.gov.au

60 YEARS OF DISCOVERY