Australian Government

ansto

Nuclear-based science benefiting all Australians

Annual Report 2011-12

Cover images

Top-
The OPAL research reactor building (p.29).
© ANSTO

Bottom row left-
Elvis Shoko standing in front of ANSTO's Linux cluster server essential for detailed computational research into the storage of hydrogen (p.25).
© ANSTO

Bottom row middle-
ANSTO's environmental studies look at many aspects of our planet's environmental systems from the impact of humans on the environment to how we can mitigate and adapt to climate change (p.21-24).
© iStockphoto

Bottom row right-
Karina Meredith working in ANSTO's Isotope Ratio Mass Spectrometry Laboratory (p.21).
© ANSTO

CHAIRMAN'S LETTER

Australian Government | ansto
Nuclear-based science benefiting all Australians

17 September 2012

Senator the Hon Chris Evans
Minister for Tertiary Education, Skills, Science and Research
Parliament House
CANBERRA ACT 2601

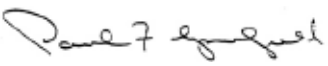
Dear Minister

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 2011 to 30 June 2012. 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 Ministers Orders.

The report has been approved for presentation to you by a resolution of the ANSTO Board members on Friday 14 September 2012.

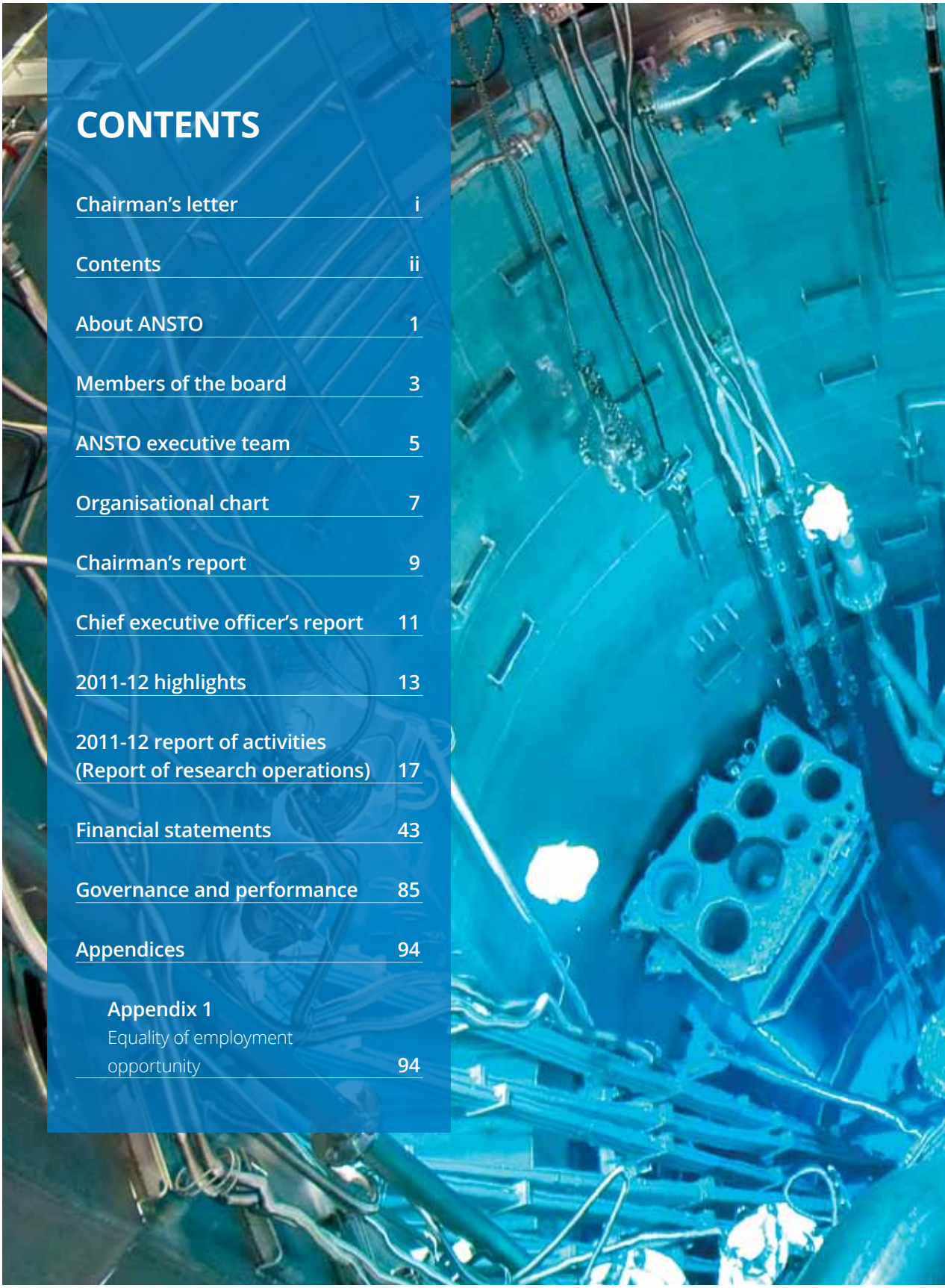
Yours sincerely

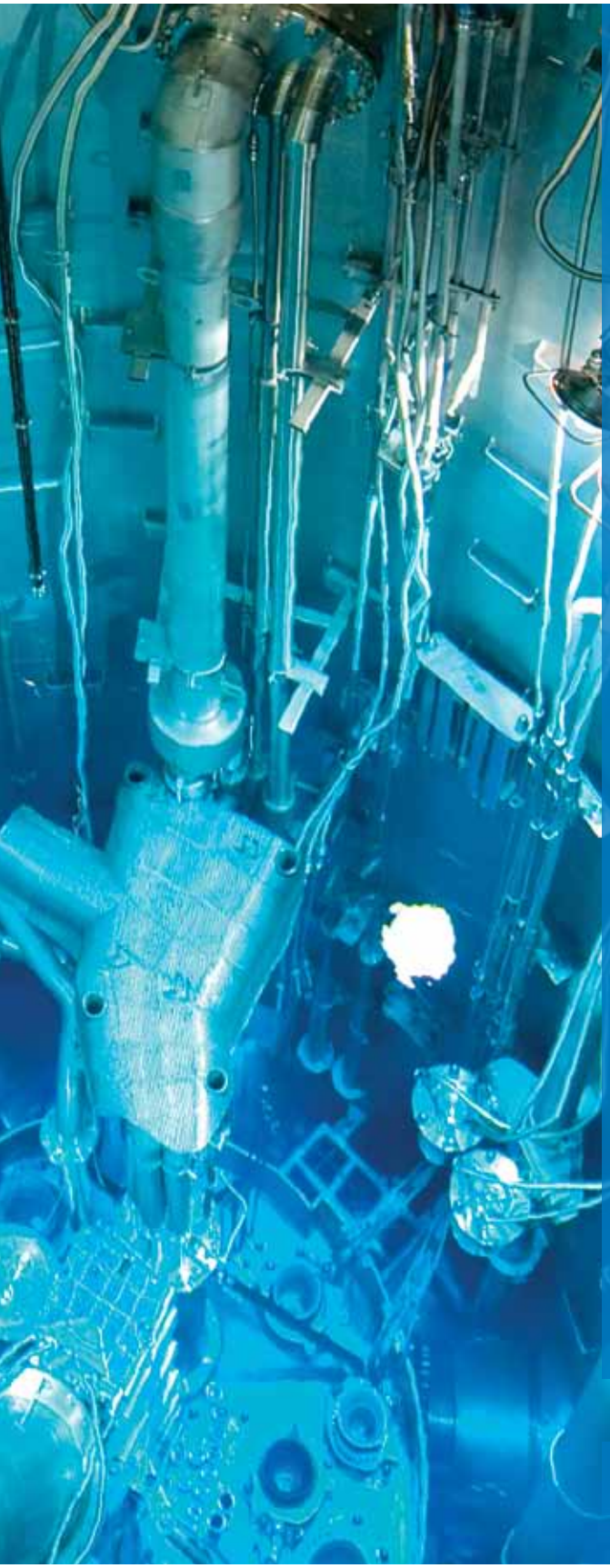


Dr Paul Greenfield AO
Chairperson

AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
New Illawarra Road, Lucas Heights (Locked Bag 2001, Kirrawee DC 2232) T +61 2 9717 3111 F +61 2 9717 9210
www.ansto.gov.au

CONTENTS





Pictured: ANSTO's OPAL reactor pool

ABOUT ANSTO

For over 50 years, the Australian Nuclear Science and Technology Organisation (ANSTO) has proudly been the home to Australia's nuclear expertise.

Nuclear science and technology is a dynamic and exciting area of endeavour that focuses on the basic building blocks of matter at the atomic level.

Many of the most important questions facing society today are within the domain of ANSTO's expertise; whether in the area of health, climate change or driving innovation for industry.

ANSTO's state-of-the-art research facilities and our connection with other local and international research centres, means our scientists have the resources and networks to make a significant contribution today and in the future.

Central to realising the capabilities of some of Australia's significant science infrastructure are our people – ANSTO has over 1,100 dedicated scientists, engineers and support staff who strive daily to exploit the opportunities nuclear science and technology offers, for the benefit of all Australians.

As a Federal Government agency, ANSTO provides advice to the Federal Government on all matters relating to nuclear science, technology and engineering. ANSTO supports Australia's international roles and obligations, contributing to nuclear non-proliferation and participating in international decision making, keeping Australia at the forefront of nuclear science and technology.

At the heart of ANSTO's research capabilities is the OPAL reactor which is one of the world's best multi-purpose research reactors. OPAL is used for scientific research, the production of medical radioisotopes, and the irradiation of silicon used in microelectronics in superfast trains and hybrid cars.

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, STAR and ANTARES, which are used to analyse materials to determine their elemental composition and age, and are fundamental to advancing knowledge in areas as important as climate change.

Development of the Federal 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 (eg. rock art) and climate variability.

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. 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.

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'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; the French Commissariat à l'énergie atomique et aux énergies alternatives (CEA); and the European Organization for Nuclear Research (CERN).

Our corporate plan

In 2010, the ANSTO Corporate Plan for 2010-2015 was developed and approved by the ANSTO Board and accepted by the responsible minister. Our 2010-2015 Corporate Plan is a public document, available via the ANSTO website, and sets out the organisation's key goals and strategic direction for this period.

Our vision

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

Our strategic directions for 2010-2015

- 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.

Statement of compliance

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

Responsible minister

Minister for Tertiary Education, Skills, Science and Research, Senator the Hon Chris Evans.

Senator the Hon Chris Evans

MEMBERS OF THE BOARD

Professor Paul Greenfield AO (Chair)

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

Vice-Chancellor University of Queensland; Academic and engineer.

Chairman since
24 February 2011

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

Professor John Hearn

BSc, MSc, PhD

Deputy Vice-Chancellor (International) and Professor of Physiology University of Sydney; Biomedical researcher and biotechnologist.

Appointed
1 May 2008

Term concluded
30 April 2012

Ms Christine McLoughlin

BA, LLB(Hons), FAICD

Chair of ANSTO's Risk and Audit Committee to 30 June 2012; 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

Scientist and businesswoman.

Appointed

12 December 2008

Term concludes

11 December 2012

Dr Adrian (Adi) Paterson

BSc, PhD

Chief Executive Officer; Chemical engineer.

Appointed

1 March 2009

Term concludes

28 February 2014

ANSTO EXECUTIVE TEAM

Dr Adrian (Adi) Paterson
Chief Executive Officer

Mr Peter Arambatzis
Chief Financial Officer

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

Mr Robert (Rob) Blissett
General Manager, Human Resources

Mr Hefin Griffiths
General Manager, Safety, Environmental and Radiological Assurance

Mr Shaun Jenkinson
General Manager, Commercial Operations

Mr Paul Jones
General Manager, Security and Safeguards

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

By invitation:

Professor Richard Banati
Distinguished Research Fellow and ANSTO LifeSciences

Ms Stephanie Cole
Legal Counsel

Mr Kobus Naude
Senior Manager, Strategy and Planning

Mr Douglas (Doug) Cubbin
General Manager, Business Development and Commercialisation

Professor John Dodson
Head, Institute for Environmental Research

Professor Lyndon Edwards
Head, Institute of Materials Engineering

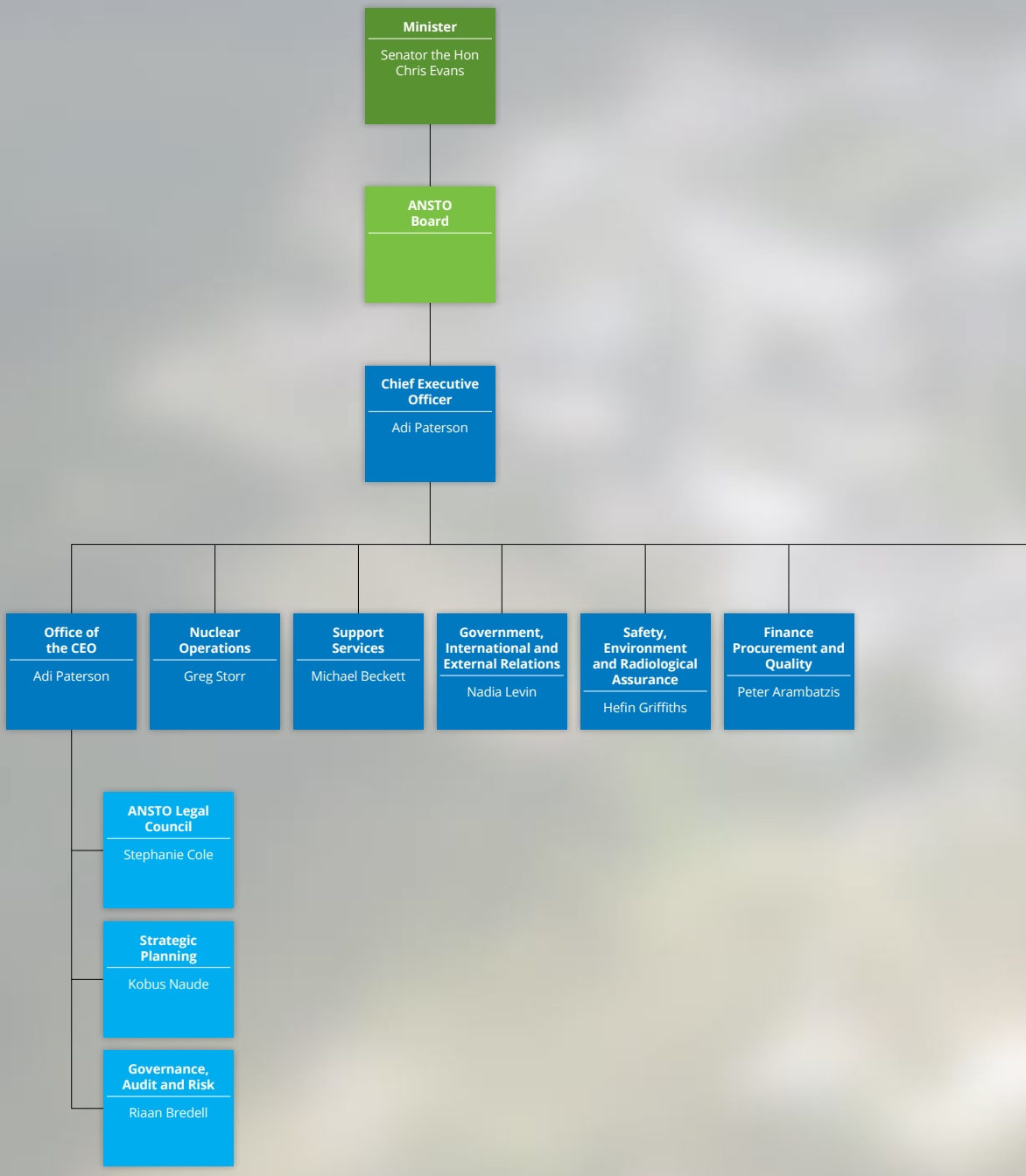
Dr Marie-Claude Gregoire
Head, ANSTO LifeSciences

Mr Con Lyras
General Manager, Engineering and Capital Programs

Dr Greg Storr
Head, Nuclear Operations

Dr Robert (Rob) Robinson
Head, Bragg Institute

ORGANISATIONAL CHART




Commercial Operations
Shaun Jenkinson
Human Resources
Rob Blissett
Business Development and Commercialisation
Doug Cubbin
Security and Safeguards
Paul Jones
Engineering and Capital Programs
Con Lyras
Research and Innovation
Rob Robinson
ANSTO Life Sciences
Marie-Claude Gregoire
Institute of Materials Engineering
Lyndon Edwards
Institute for Environmental Research
John Dodson
The Bragg Institute
Rob Robinson

CHAIRPERSON'S REPORT

I look back proudly on 2011-12 as a year where ANSTO has contributed to incredible discovery, where we have met considerable challenges, and where we have built our capacity to enhance the lives of Australians through adding to our suite of infrastructure and delivering on our strategies.

This year ANSTO has made significant progress on rolling out our medium and long term visions for our organisation. We are now in our second year of implementing the ANSTO 2010 - 2015 Corporate Plan, which sets out ANSTO's strategic priorities in terms of delivering world class infrastructure; expanding ANSTO's reach and contribution; serving the needs of the public and our stakeholders; and driving organisational renewal. This is a plan which is being lived, and its continued successful roll out is evidenced in everything from construction of new accelerators and environmental facilities at Lucas Heights, to our continued strengthening of partnerships with domestic and international science organisations.

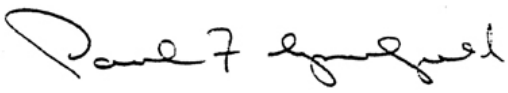
Focussing on the longer term, ANSTO has also made significant initial steps this year towards delivering on the vision outlined in the ANSTO 2055 Infrastructure Plan. This is the long term plan that will see transformation of our Lucas Heights campus into a site that is welcoming, interactive and more accessible to the public – with state-of-the-art facilities that equal the world-leading science that we already do here today. Work undertaken in the past year includes implementation of zoning to guide development of like business units in the same broad areas on site, and enactment of improved building codes that will guide sustainable future development around the campus.

In line with our plans, a focus for 2011 – 2012 has been working across the government to magnify our influence and spread the benefit of our expertise. Notably, we continue to collaborate closely with Department of Foreign Affairs and Trade (DFAT) and relevant state and federal security agencies to contribute to Australia's ongoing national security, including counter-terrorism preparedness. ANSTO's nuclear expertise continues to ensure Australia has a seat at the table when it comes to ongoing regional nuclear non-proliferation talks.

It is always pleasing when good work is recognised, and this year Australia was acknowledged as having the best nuclear materials security practices in the world, according to the Nuclear Threat Initiative – an international organisation that works to improve global security and fulfilment of the goals of non-proliferation treaties. As home of Australia's only nuclear reactor and a significant proportion of our nuclear materials, and forensics and science expertise, the report was a strong endorsement of the security and safety measures that ANSTO has in place.

Particularly against the backdrop of a tight federal budget, it is pleasing that ANSTO's financial performance this year was strong, and continues to track well. Earnings by ANSTO's commercial groups were up $12.9 million to $63.9 million this year – an increase of more than 25%. This growth has been driven across several of ANSTO's business units, including those in the health, minerals and silicon irradiation areas.

I am pleased to present my second ANSTO annual report. I take this opportunity to thank the Board, Executive Team and staff for all your hard work, and congratulate you on your achievements throughout the year. I know you share my excitement about ANSTO's strong and continuing role in improving Australia's health and environment, in partnering with key industries to make them more profitable, and in pushing the frontiers of Australian science.



Dr Paul Greenfield AO
Chairperson

CHIEF EXECUTIVE OFFICER'S REPORT

I have great pleasure in presenting ANSTO's Annual Report for 2011-12. We are on track to deliver against the objectives of our Corporate Plan. The ANSTO Board is playing a critical role in ensuring that we stay focussed and continue to reflect on our strategy on a regular basis. I would like to record my appreciation to our Chairman, Professor Paul Greenfield, and the Board members for the governance role they play and the great value they contribute to the development of ANSTO as a strategically managed and accountable organisation.

Each year we convert our strategic plan into a one year 'strategy on a page' that guides us in a more detailed way to achieve clear goals and objectives. In the current year we have had a notable increase in the performance of our commercial groups. This considerable achievement was underpinned by an operational excellence program and other organisational changes that had been put in place to support sustainable results. I would like to give great credit to the people who have embraced the training and have converted that training into practical actions that have delivered this very visible result. For ANSTO this is not so much about the growth of revenue but a focus on the needs of our customers, and their customers, so that we can create benefits in Australia and the region through the specialised services and products we supply.

In the domain of innovation and business development, ANSTO has undergone a significant transformation in the last few years. We have new capabilities to convert research and development outcomes into practical and accessible products and services and introduce innovation into Australia from other parts of the world. This is one of the most exciting areas of our work. For example, during the course of this year a unique membrane technology that cleans waste water went through its final stage of transfer into the market where it is being successfully operated by BioGill Environmental Pty Ltd. We are very proud of their success which is built on inventions initially developed at ANSTO.

ANSTO mobilises landmark infrastructure to serve users. During the year we brought a number of facilities into service. These included a solid targetry laboratory developed in partnership with the Ludwig Institute at the Austin Hospital in Melbourne and a national imaging facility developed in collaboration with the University of Sydney in Camperdown. These two partnerships were complemented by the opening of a facility for the measurement of environmental radioactivity by our minister, Senator the Hon Chris Evans in April.

Neutron scattering, accelerator techniques, radioisotope labelling and working with active materials does not immediately lead to headline grabbing outcomes. Our research platforms create the potential for our users, researchers and collaborators to do science and engineering that will change the way we live and how healthy we will be in the future, as well as creating opportunities to save resources, sustain our fragile environment and ensure safety and security for all Australians. The infrastructure is important but our people are more important. Our scientific productivity and impact has improved even as we have expanded the number of users, partners and collaborators.

ANSTO has developed strong relationships with a range of stakeholders in government. We have sought to engage local stakeholders so that there is a keen understanding of the importance of careful stewardship in relation to the benefit we receive from nuclear medicine. In May we launched a communication initiative in relation to the return of waste from our spent fuel. We have been greatly encouraged with the positive feedback and the helpful engagement that has resulted from this. It is clear that the vast majority of people interested in this topic are seeking to deepen their understanding using an evidence based approach.

The Annual Report contains significantly more detail on what has proved to be a safe and successful year for ANSTO. The period ahead will be challenging in a more uncertain global context but I am sure that the organisation is well prepared to continue to seek positive outcomes and effective progress in meeting our corporate objectives. I would like to express a final thank you to the Executive and senior leadership at ANSTO for their critical contribution both now and into the future.

Dr Adrian (Adi) Paterson
Chief Executive Officer

2011-12 HIGHLIGHTS

New centre for environmental measurement

Built from materials with ultra-low background radiation levels, ANSTO's state-of-the-art centre for environmental measurement allows scientists to detect tiny amounts of radioactive material that would normally be lost amongst background radiation in a regular laboratory.

Isotopic and nuclear techniques to trace the impacts of humans on the environment, including monitoring radiation levels at ANSTO's Lucas Heights campus, will be undertaken at the centre.

Designed to the highest OHS standards following input from ANSTO's Safety, Environmental and Radiological Assurance (SERA) team, and with a range of 'green' environmentally friendly features, the Centre will be used as a benchmark for design and development of new buildings at ANSTO.

The innovative building design accommodates the ITRAX Corescanner, the only scanner of its type in Australia that can reconstruct the environmental and climate history of an area by analysing sediment cores and tree ring samples. It is anticipated that the new equipment will attract scientists from universities and research organisations from across Australia.

The Centre was officially opened on 24 April by the Minister for Tertiary Education, Skills, Science and Research, Senator the Hon Chris Evans.

Minister for Tertiary Education, Skills, Science and Research, Senator the Hon Chris Evans at the opening of the new centre for environmental measurement.

ANSTO's new centre for environmental measurement.

National Imaging Facility Research Cyclotron

A new $25 million National Imaging Facility (NIF) Research Cyclotron for biomedical imaging was opened at Camperdown in Sydney.

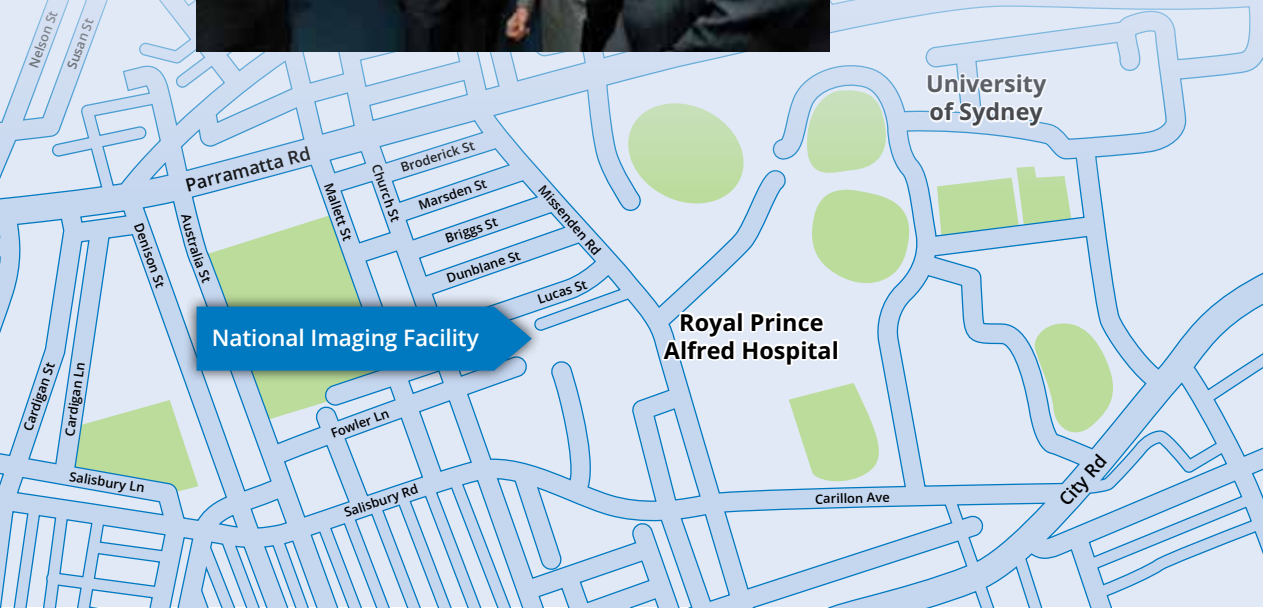
The result of collaboration between ANSTO and the University of Sydney, the facility also comprises Australia's most advanced radiolabelling equipment and access to nearby biomedical imaging laboratories located at the University of Sydney's Brain and Mind Research Institute (BMRI).

As the most advanced facility of its type in Australia, the laboratories are equipped with preclinical and clinical scanners that probe soft tissue at the molecular level to measure specific biological functions related to disease. A high performance computing platform then provides advanced imaging analysis and modelling.

More than 30 scientists are working under the partnership, developing new research techniques and studying diseases involving the brain. The facility also allows access by external scientists through the NIF network.

Officially opened on 6 December by Her Excellency Professor Marie Bashir AC CVO, Governor of New South Wales, the facility received investment from the Australian Government, ANSTO, the University of Sydney and the NSW Government.

Her Excellency Professor Marie Bashir AC CVO (centre) at the opening of the new facility.



2011-12 HIGHLIGHTS

Membrane bioreactor and sewage treatment technology

In March a ground-breaking water cleansing technology developed at ANSTO was successfully commercialised and the intellectual property sold to Australian clean-tech company, BioGill Environmental Pty Ltd, a manufacturing company based in Sydney.

The system has numerous industrial and environmental applications, including the treatment of grey water, sewage and wastewater from aquaculture, and food and beverage processing.

The technology is also considered to have great potential for cleaning water on ships, offshore platforms and remote islands where protecting sensitive environments is essential.

(L-R) Founder and CEO of BioGill, John West; BioGill Director of Finance and Administration, Louise West: ANSTO Business Development Manager, Rosanne Robinson; and ANSTO General Manager, Business Development and Commercialisation, Doug Cubbin.

2011 Eureka Prizes

ANSTO's Vanessa Peterson was a nominee for the Australian Museum's 2011 Eureka Prize People's Choice Award for her work on one of the world's biggest challenges - developing renewable, clean energy technologies.

Using OPAL, Vanessa's research is helping to better understand materials that store and deliver charge, particularly those for the transportation sector. These materials include batteries for use in electric vehicles, and alternative energy-systems based on hydrogen. The results of this research could ultimately help us to make petrol engines redundant, with power produced from hydrogen resulting in clean water as the only by-product.

Although Vanessa did not win the award, her nomination was a fantastic opportunity to raise the profile of ANSTO's research addressing Australia's sustainable energy future.

ANSTO also sponsored the inaugural Innovative Use of Technology prize at the Australian Museum's 2011 Eureka Prizes. This prize is awarded to individuals or groups who have used new or existing technology in an innovative way to improve the outcome of their research.

(L-R) ANSTO's Dr Geraldine Jacobson, Dr Michael Law and Dr Vanessa Peterson.

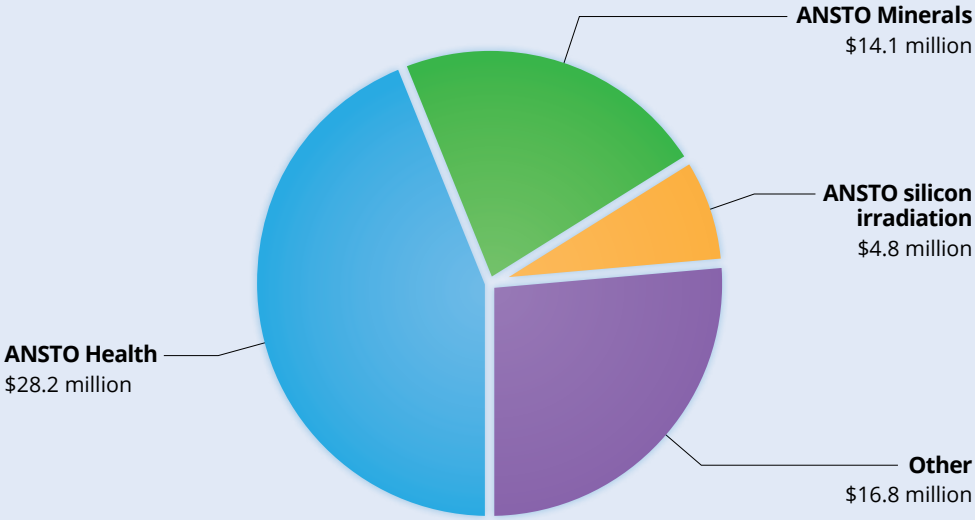
External revenue

External earnings by ANSTO business and commercial groups amounted to $63.9 million in 2011-12. This was up $12.9 million, a 25.3 per cent increase on the previous year.

The ANSTO Health business continues to grow and now exports Molybdenum-99 (Mo-99) to the United States of America (USA). ANSTO Health's revenue earnings were $28.2 million in 2011-12, up $0.95 million from the previous year.

ANSTO Minerals' revenue earnings for 2011-12 were $14.1 million. This was up $1.9 million from the previous year, largely due to continual commercial activities in the minerals industry including uranium and rare earths.

ANSTO silicon irradiation revenue earnings for 2011-12 were $4.8 million. This was also up on the previous year's results with an increase of $0.8 million.



2011-12 REPORT OF ACTIVITIES

Australia's nuclear experts

Australian nuclear security ranked best in the world

In January a global report on nuclear materials security around the world ranked Australia number one out of 32 countries including the United Kingdom, United States of America (USA) and Japan.

According to the Nuclear Materials Security Index Report released by the Nuclear Threat Initiative — a non-profit, non-partisan organisation that works to improve global security and fulfilment of the goals of non-proliferation treaties — Australia has the best nuclear materials security practices in the world.

As custodian of Australia's only nuclear reactor, this report is an independent endorsement of the security and safeguards ANSTO, working closely with the Australian Safeguards and Non-Proliferation Office, has in place.

Aerial view of ANSTO's Lucas Heights campus located 30 km south-west of the Sydney CBD, and situated on a 70 hectare site surrounded by large areas of natural bushland.

Fukushima marine environment study

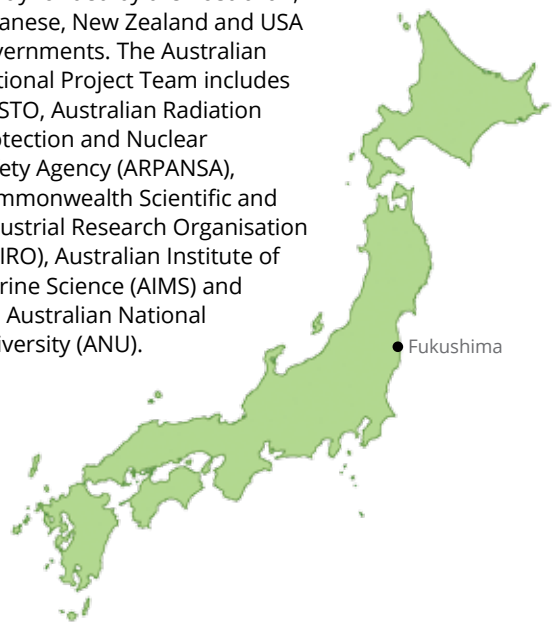
Australia is leading a study within the Asia-Pacific region to assess the extent of contamination and its impact on the marine environment from the Japanese Fukushima Daiichi nuclear plant incident in March 2011.

The project was launched at a meeting in Sydney in late 2011, attended by nuclear specialists from over 20 Asia-Pacific nations.

The meeting set out the activities that will be implemented over the life of the project. These include sampling of seawater, sediment, plant and animal life; analysis of sampling results to determine current radiation levels; modelling of radionuclide fate and transfer from seawater to living organisms; and training programs for countries lacking the skills to undertake these activities.

The overall aim of the project is to provide a comprehensive overview of the total extent of the subsequent radioactivity and its impact and provide reassurance as to the safety of our region's people, animals and environment.

The International Atomic Energy Agency (IAEA) initiated four year project is being jointly funded by the Australian, Japanese, New Zealand and USA governments. The Australian National Project Team includes ANSTO, Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian Institute of Marine Science (AIMS) and the Australian National University (ANU).



Leading the way in decommissioning

With ANSTO's former reactor Moata now fully decommissioned and dismantled, and preparations under way for the future dismantling of ANSTO's other former reactor HIFAR, ANSTO has a level of decommissioning expertise that is being harnessed to provide training and demonstration to other countries considering reactor decommissioning.

This expertise was demonstrated at a workshop in May on Research Reactor Decommissioning, hosted by ANSTO's decommissioning team, as part of the IAEA's Research Reactor Decommissioning Demonstration Project (R2D2). The R2D2 Project provides a platform that can be used for 'hands-on' and practical training in activities related to safe decommissioning.

ANSTO hosts successful Iron Koala exercise

As a leader in global nuclear security, ANSTO hosted a Global Initiative to Combat Nuclear Terrorism (GICNT) activity in Sydney in May. Known as Iron Koala, the exercise was organised by the GICNT Nuclear Forensic Working Group of which Australia is the chair.

The purpose of the event was to increase awareness of the need for legislated, regulated and routine information sharing between countries and professions, in order to prevent the trafficking of nuclear and radioactive material.

Plan in place to safely manage medical and research waste

In April, ANSTO announced it would apply for a licence to construct an interim storage facility for Australian intermediate level radioactive waste generated by several decades of nuclear medicine production and scientific research.

In the absence of a national radioactive waste management facility, the proposed new interim storage facility at Lucas Heights would enable Australia to meet obligations to repatriate Australian waste currently being reprocessed in France and due to return to Australia by the end of 2015 under arrangements established by governments in the 1990s.

Subject to regulatory approval, the proposed interim facility would operate from late 2015 while planning is underway for the siting, design and construction of a permanent national radioactive waste management facility.

The proposed facility will be assessed by the independent regulator ARPANSA and the assessment will include a public consultation process.

Artist's impression of the proposed intermediate level waste storage building.

Health and life sciences

Cell membrane studies helping to tackle antibiotic resistance

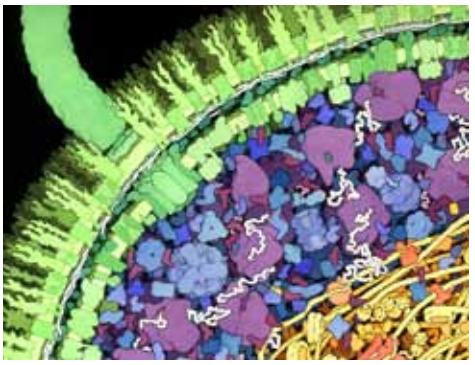
Due to the increase in antibiotic-resistant bacteria, there is a large international research effort underway to develop antibiotics that attack bacterial membranes to help combat the threat posed by antibiotic resistance.

As around 40 per cent of all new medical drugs target cell membranes, more advanced cell membrane models are needed to assist with this important area of research.

ANSTO's Anton Le Brun has developed simple models of the bacterial outer membrane and investigated the molecular structure of the model membrane using neutron reflectometry on ANSTO's reflectometer, known as Platypus.

As membranes are highly complex structures, models, or man-made copies of a bacterial membrane, are needed to better understand the effectiveness of a potential new drug.

Initial results indicate that Anton's models reflect the properties of membranes in nature and the models will be an important tool for studying how membranes function and how antibacterial agents and other drugs interact with membranes.



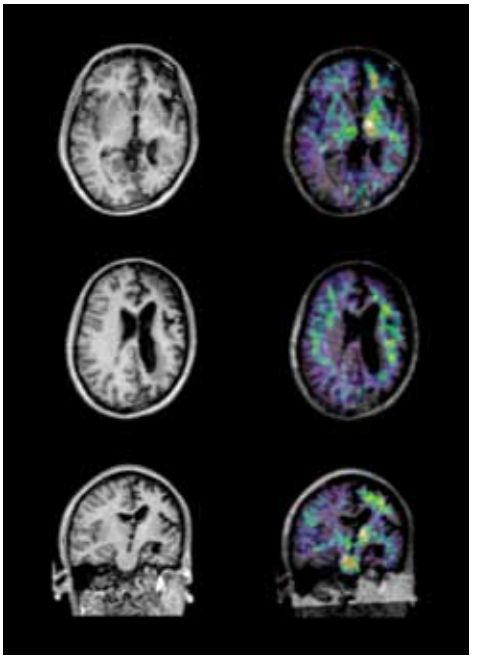
An artist's impression (David S. Goodsell 1999) of molecules in a slice of an E. coli cell. The green areas show the membrane under study.

Understanding inflammation in the brain

The translocator protein is a marker of inflammation in the brain, neuroinflammation, which is implicated in diseases such as multiple sclerosis and Alzheimer's disease.

An understanding of the structure and function of this protein is vital in developing drugs to treat neuroinflammation. ANSTO research, headed up by Claire Hatty and scientists from the University of Sydney, used the Platypus neutron reflectometer to study the structure of the translocator protein at the molecular level, to gain a deeper understanding of the protein and its interactions with potential drugs.

This fundamental information could help in understanding how the translator protein relates to inflammatory disease.



A better understanding of the translocator protein will assist with the development of drugs to treat inflammatory disease in the brain.

Assessment of gamma irradiation on internal mango quality

The Australian mango fruit grower's market is a substantial industry sector that is anticipated to grow by 20 per cent in 2014. The ripening, transportation, and saleable life-span of mangoes depends on keeping the fruit free from pests and disease.

Worldwide, the use of irradiation is emerging as a viable, chemical-free alternative to traditional pesticides.

Research by ANSTO's Radiation Technologist Connie Banos, working with the University of Sydney and the Queensland Department of Employment, Economic Development and Innovation, builds upon our knowledge of the physiological responses of three new Australian mango fruit hybrids to varying doses of gamma irradiation following harvest. Of particular interest was the question of whether irradiation may degrade the fruit, such as cause damage to lenticels (small pores on the fruit's outer skin).

The study illustrates how ANSTO's expertise makes a crucial contribution to the development of Australia's national food security by providing new insight into the viability of irradiation to achieve safe phytosanitary (pest and disease) protocols for the agriculture industry.

Environment and climate change

Miniature Antarctic forests give us a glimpse into future climate change

ANSTO research could provide valuable insights into the future effects of climate change including the potential for significant disruptions in growth patterns for the world's vegetation, based on water availability, and the subsequent flow-on effects that could be expected further up the food chain.

The studies by ANSTO's Senior Research Scientist Quan Hua and scientists from the University of Wollongong on Antarctic moss shoots, one of the smallest and last untouched species on the planet, suggest the plant species is showing symptoms of climate change.

Through carbon dating and measuring the depth of moss colonies, considered to be the 'old growth forests' of Antarctica in miniature, scientists observed up to a seven-fold slowdown in the growth of some species from changes in temperature and wind speeds.

Radiocarbon in the shoots of moss are revealing the effects of Antarctic climate change.

Groundwater 'age' assessment in the Gnangara Mound, Western Australia

Accelerator mass spectrometry research using ANSTO's tandem particle accelerator, STAR, is helping to understand the age of groundwater aquifers of the Perth Basin and how frequently the water is being replenished, in order to determine how much of the resource is available for use.

Led by Karina Meredith, a team of ANSTO scientists worked with the Government of Western Australia's Department of Water, determined the age of groundwater to be 23,000 to 35,000 years old. Although this result was expected, what was surprising was the identification of an area of younger groundwater at depths of 300 metres below the ground surface. This area is of prime interest for water resource managers because it shows fresh water is replenishing the otherwise isolated underground system.

The Gnangara groundwater system supplies up to 70 per cent of Perth's potable water during periods of drought. The sustainable use of this important resource is of major importance for future development in and around Perth.

Karina Meredith in the Institute for Environmental Research working in the Isotope Ratio Mass Spectrometry Laboratory.

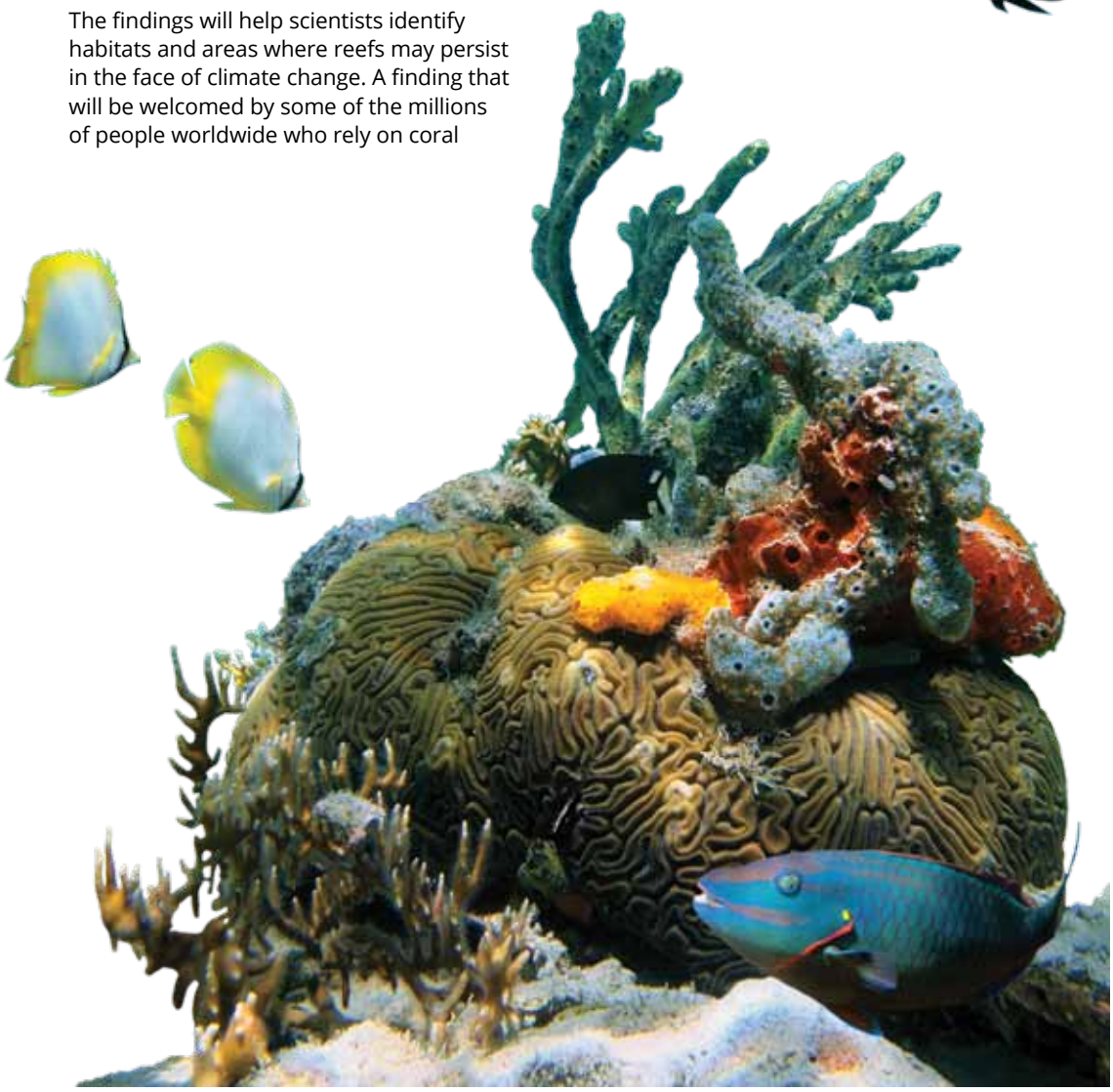
Some corals like it hot

When water temperatures get too hot, tiny algae that provide coral its colour and major source of food are expelled. This phenomenon, called coral bleaching, can lead to the death of corals.

While working in the central Pacific region, a team of international scientists including ANSTO's Post-Doctoral Fellow Jessica Carilli, discovered that coral which has survived heat stress in the past is more likely to survive it in the future.

The findings will help scientists identify habitats and areas where reefs may persist in the face of climate change. A finding that will be welcomed by some of the millions of people worldwide who rely on coral reefs for sustenance and their livelihoods, particularly those in the fishing and tourism industries.

Planning is now underway for potential future studies of corals in areas of the world that have not experienced significant historical changes in water temperatures.



Forest soil erosion in the wake of major bushfires

The results from ANSTO research into the effects of severe bushfires, such as Australia's 2009 Victorian 'Black Saturday' bushfires, is helping bushland and forest conservation efforts.

Severe bushfires expose the soil in bushland. Subsequent high intensity storms — possibly once-in-a-hundred year events — can then generate significant erosion with massive debris flows even in small creek systems.

A study by ANSTO's Michael Hotchkis together with researchers from the University of Plymouth in the United Kingdom and the University of Melbourne, was undertaken to better understand processes that influence the evolution of landscapes subject to such events.

The fate of the forest soil is of particular interest as it can tell us whether the existing conditions are sustainable or not. For example, if severe bushfires are followed by severe storms resulting in a net depletion of soil, then we know that there is going to be damage to the soil and subsequently, the forest, rather than a sustainable equilibrium.

Fallout plutonium isotopes, measured at trace levels using the ANTARES accelerator, were used for the first time in this kind of study.

Photo of Myrtle Creek showing significant debris deposits left behind after sudden intense storm events in 2009.

Prehistoric cold case links humans to Tasmanian megafauna extinctions

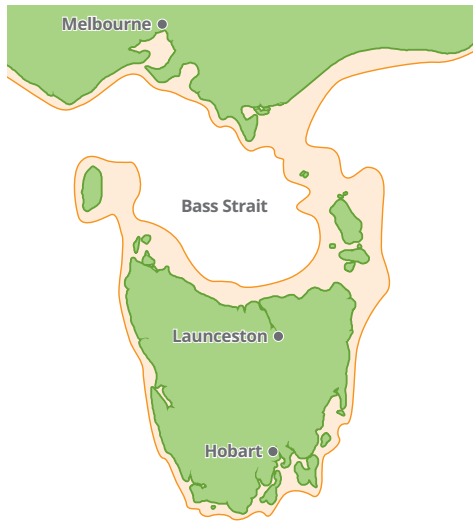
A team of Australian and New Zealand researchers including ANSTO's Vladimir Levchenko have discovered fresh evidence that could unravel the mystery of what killed Tasmania's giant marsupials over 40,000 years ago.

Analysis carried out at ANSTO on the skeletal remains of extinct mega fauna provided substantial proof that for about 2000 years they in fact shared the island with early humans before suddenly disappearing before the last ice age.

The findings challenge current historical views, now placing our ancestors in Tasmania at the same time as large prehistoric animals, like the Protemnodon anak (a giant wallaby) and raising the real possibility we were involved in their extinction.

Geological work on sea level change suggests humans could not have crossed Bass Strait until around 43,000 years ago when the island was temporarily connected by a land bridge to mainland Australia.

The next steps in the research are to find evidence of interactions between humans and megafauna to make the findings conclusive.



Approximate contour for the Bass Strait land bridge.

Climatic instabilities' effect on Australia's monsoon tropics

Recent climate predictions suggest Australia will experience more high-intensity tropical cyclones and flooding leading to extensive economic and social disruption.

These predictions are based on modelling global warming scenarios using short-duration historical cyclonic records. In order to improve future modelling of cyclone frequency, we need to find evidence of extreme events occurring over the past few tens of thousands of years.

Research results using ANSTO's ANTARES accelerator and headed up by ANSTO's Toshiyuki Fujioka together with the University of Wollongong, have indicated mega floods in the Kimberley region occurred during the end of the last three major episodes of global ice ages, occurring about 10,000-18,000, 125,000-135,000, and 240,000-250,000 years ago.

Corresponding with these ice ages, global temperatures rapidly increased in association with polar-ice melting and sea-level rise. Therefore climatic instability, potentially induced by current global warming, may increase the magnitude of tropical cyclones and storms and thus associated floods. These results indicate that rapid increase of global temperature and future increases in global sea-level, may increase the magnitude of tropical cyclones and extreme flood events.

These results are consistent with the findings of the Intergovernmental Panel on Climate Change Report '*Climate Change 2007: Synthesis Report*'.

Below:
Members of Cosmogenic-Exposure Dating Group at ANTARES. (L-R) Charles Mifsud, Steven Kotevski, Toshi Fujioka, David Fink and Krista Simon.

Materials engineering

Cheaper, more-efficient electric equipment screens

Organic light-emitting diodes (OLEDs) are extensively used in devices such as television and mobile phone screens, but their life-time depends significantly on the stability of the chemical layers that form these devices. Structural changes at the interfaces between these layers, which can occur during production or when the device heats up, dramatically affect how electrical charge travels through the device leading to changes in its performance.

Together with the University of Queensland, ANSTO's Tamim Darwish and his team used neutron reflectometry and specifically synthesised deuterated molecules that are typically used in OLEDs, to study the combining of layers and the structural changes that take place on the nanoscale, or sub-microscopic level.

The results will improve the functioning and efficiency of the next generation of these devices.

Tamim Darwish is setting up a hydrothermal deuteration reaction in a Parr high pressure reactor.

Hydrogen storage for clean energy

Environmental sustainability is driving energy production and use towards cleaner and greener technologies such as using hydrogen as a fuel. However, this raises the problem of how best to safely store hydrogen.

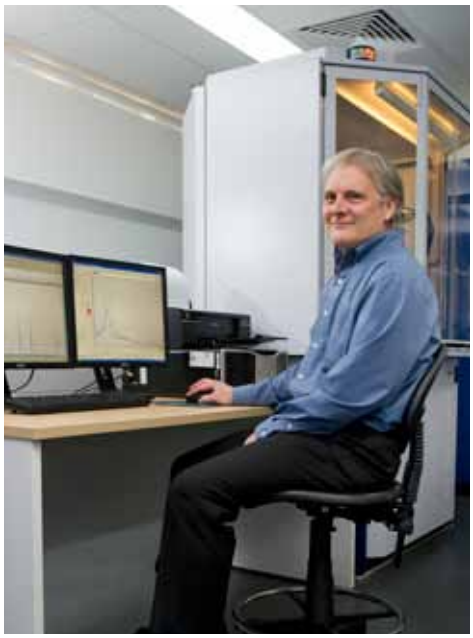
An ANSTO study, led by Elvis Shoko and using ANSTO's Linux cluster computer server, investigated trapping hydrogen molecules (H_2) in ice. This forms a clathrate hydrogen hydrate, which is essentially an ice cage which can hold hydrogen. Although this research focuses on ice, there are other options for cage materials and we need to understand how the hydrogen interacts with the container carrying it. This is best done by analysing how the hydrogen molecules move around in the cage. The research also tackled the question of whether the cage's own thermal motion is important.

Although complex, these questions must be understood because they relate directly to the performance and safety of the hydrogen storage material. This research used a more rigorous approach than has been commonly used previously, taking into account the cage's flexibility rather than assuming that the cage is rigid. This has highlighted the shortcomings of previous experiments. It is crucial to correctly calculate the interaction between the hydrogen and the cage so that we can work towards ice composite materials that can safely store more hydrogen.

Understanding radiation damage at the atomic scale

Materials for future nuclear applications all share one important property: the ability to maintain functionality during exposure to extreme levels of irradiation. Developing such materials requires an in-depth understanding of the atomic processes that attribute to the build-up of radiation damage.

ANSTO's Greg Lumpkin and Karl Whittle, together with researchers from Curtin University, used atomistic scale simulations to discover the mechanisms of initial defect formation. Allowing a first-hand look at which factors contribute to a material's radiation tolerance or susceptibility will help us understand and design prospective nuclear materials and bring us one step closer to developing more radiation tolerant materials.



ANSTO's Greg Lumpkin is part of a team using atomic scale simulations to better understand what factors contribute to a material's radiation tolerance.

Extending the service life of welded components

The study of welds — and most importantly, the residual stresses induced during welding — is receiving greater attention within a wide range of engineering fields due to safety issues that may be experienced if the weld fails.

Weld-induced residual stresses are a particular concern in safety critical components and assemblies, since these stresses may lead to the premature failure of a given system. One of the most common causes of failure are cracks that develop in or near welds; the problem of premature cracking is exacerbated in a severely hot or corrosive environment.

For this reason, the effects of welds are considered when performing remaining-life assessments and safety inspection schedules for the power generation industry, where a complex system of welded components and piping are used to produce and deliver steam to turbines. As the cost associated with extensive experimental analyses can be prohibitive, simulations via numerical analyses are employed to predict the weld-induced residual stress field in a component. These predicted stresses may then be used to study the in-service structural integrity of an object.

ANSTO's research led by Cory Hamelin developed a model to predict this intricate phenomenon. Ultimately, this weld model may be used to optimise the welding process used for ferritic (iron) steels, in an attempt to extend the service life of welded components.

An investigation of residual stresses in insulated rail joints

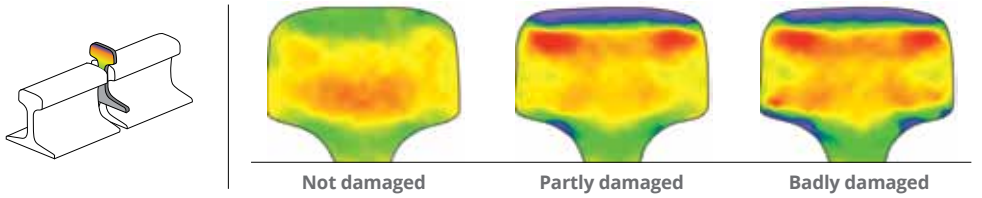
Insulated rail joints (IRJs) are an integral part of any rail track system, as they split a continuous rail track into electrically isolated sections for signalling and easy detection of rail track damage. Bonded IRJs are safety-critical components that must satisfy requirements for structural integrity as well as the isolation function for both railway signalling and track condition monitoring systems.

In heavy haul corridors in Australia and around the world, IRJs are periodically replaced due to accumulated damage in their railhead, often within 10-20% of the useful life of other rail components.

Their replacement is the single largest track maintenance cost in New South Wales, apart from track ballast work. Neutron diffraction can tell us what happens to material and residual stresses within used rails and trace down accumulation of damage caused by stresses throughout rail service history.

ANSTO's study led by Vladimir Luzin and working with The University of Wollongong and the Queensland University of Technology, Cooperative Research Centre (CRC) for Rail Innovation is helping railway engineers better understand how residual stress fields evolve in service and enable them to develop IRJs with longer service lives, as well as determine the most appropriate rail maintenance and replacement schedules for safe and economic operation.

Understanding residual stress in insulated rail points is vital for rail maintenance and extending service lives.



Neutron diffraction can show the evolution of the residual stress in rails of different service history.

New technologies for national security

Investigating the impact of radiation and radioactive contamination on forensic trace evidence

The collection, handling and analysis of forensic evidence from a radiological crime scene presents significant challenges. The potential for the use of radioactive materials in a malevolent act has been heightened in recent years, and it is highly likely that some or all of the physical evidence recovered after such an event may have been exposed to ionising radiation or contaminated with radioactive material.

Authorities need a way to safely collect, handle and examine potential evidence contaminated with radioactive material. ANSTO's research being led by Nuclear Forensics Research Facility team member, Tegan Evans and working with the University of Canberra, the University of Technology, Sydney and the Australian Federal Police Forensic and Data Centres, explored the impact that high-energy alpha particles have on traditional evidence types including fingermarks, DNA, hairs and fibres.

The study also developed new methods for handling and processing traditional evidence contaminated with radioactive material, in particular the examination of the evidence in modified glove boxes (sealed enclosures that are designed to allow hazardous materials to be safely handled in a separate atmosphere). These boxes featured fingerprint development equipment, a variable wavelength light source for enhancing and viewing fingerprints, and a camera for imaging of enhanced fingerprints.

Improving the identification of radiological and nuclear materials

The illicit trafficking of radiological and nuclear material is a major concern for the international community. In the near future the United States will require all trade partners to perform passive radiation screening on 100 per cent of the cargo at the country of origin.

However, the current limited performance of radiation detection systems in border security applications can impact the flow of commerce (through high false alarm rates at ports of entry) and potentially fail to detect the presence of illicit radioactive material.

Research by ANSTO's David Boardman has led to the development and evaluation of a new technology in the form of identification algorithms that address these issues and maintain a high true positive alarm rate whilst minimising the false positive alarm rate. This research will contribute directly to our national and international security.

David Boardman, Alison Flynn and Mark Reinhard are helping Australia meet its international requirements for radiation screening.

Operation of OPAL and other facilities

OPAL

In the 2011-12 financial year, the OPAL research reactor operated for 294 days at high power, which translates to a total availability of 80 per cent and a planned availability against the schedule of 96 per cent. There has been a steady improvement in reactor availability over the early years of operation, with the latest result being amongst the highest in the world for research reactors.

OPAL staff produced a major safety report, called the OPAL Periodic Safety Review 2011, which was submitted to ARPANSA to fulfil a condition of the operating licence. The report was subjected to an international peer review, and the initial response from ARPANSA noted that the report had 'international significance'.

Successful production of reactor based radiopharmaceuticals, neutron activation analysis for scientific research, and irradiation of neutron transmutation doped silicon was achieved during the year using OPAL. The efficiency of the delivery of these products and services was enhanced through the ANSTO wide operational excellence initiative that is improving operation efficiencies across the organisation.

The Cold Neutron Source supplies important low energy neutrons for scientific research, which allows researchers to study the structure and properties of a wide range of biological materials, plastics and ceramics at the nano-scale. The Cold Neutron Source System was unavailable for about 33 per cent of the year due to work being undertaken on the helium gas compressors. Further major rectification work is planned for this system in 2012-13 to improve availability above 90 per cent.

The commissioning of the Heavy Water Upgrade System was completed, and the heavy water purity was increased to near optimum levels, which will assist with improved production efficiency.

ANSTO plans to operate the reactor for about 270 days in 2012-13. A six-week major shutdown is scheduled to commence in November 2012 to install Bilby, a second small angle neutron scattering instrument.

ANSTO staff viewing the OPAL reactor pool.

Neutron-beam instruments

OPAL's neutron research facilities contain neutron-beam instruments which use OPAL's neutrons for solving complex research and industrial problems in many important fields.

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 2011-12, four of which were funded under a national Education Investment Fund (EIF) project.

Following the Japanese Fukushima Daiichi nuclear plant incident that affected Japan's JRR-3M research reactor and the J-PARC spallation neutron source, ANSTO provided neutron instrument beam time for several Japanese universities and hosted the 2011 Asia-Oceania Neutron Scattering Association (AONSA) Neutron Scattering School which was previously scheduled to be held jointly at JRR-3M and J-PARC.

Pelican's massive seven tonne vessel being positioned.

Radiopharmaceutical production facilities

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 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 constant supply of radiopharmaceuticals for Australians.

Molybdenum-99 decays to form technetium-99m the most commonly used radioisotope.

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 disease, 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
- Irradiation of quarantined goods
- Plant mutation studies
- Sterilisation of medical products
- Accelerating long term storage effects on products such as plastics and electronics.

The GATRI pool. GATRI is a wet storage cobolt-60 batch irradiator.

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.

ANSTO is well underway with the construction of the Centre for Accelerator Science (CAS) at Lucas Heights, with a $62 million grant funded by the national Education Investment Fund (EIF) project.

The Centre, which is expected to be completed in early 2013, 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.

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 has a formal agreement with the European Organization for Nuclear Research (CERN) home to the world's largest accelerator, the Large Hadron Collider (LHC) which is a 27 kilometre circular accelerator, located 100 metres underground at CERN, near Geneva.

By engaging with CERN, ANSTO and Australia are benefiting from cutting-edge research and gaining the opportunity to develop expertise through CERN's particle-therapy platforms and large-scale accelerator facilities.

Artist's impression of the new CAS building being constructed at ANSTO's Lucas Heights site.

Community and education

ANSTO has provided free guided tours of its facilities to the public for over 20 years. The tours are a powerful tool for educating the community on the facts and benefits of nuclear science while helping dispel commonly held misconceptions.

A total of 10,916 people participated in a record 563 tours in the 2011-12 financial year, this is compared to 535 tours in the previous year.

ANSTO offers a range of tours which are tailored for primary, high school and university students, community organisations, business and scientific associations and VIPs.

Significant education initiatives developed in 2011-12 included:

- A popular range of Science Workshops for Kids, where children aged 8 to 14 years conduct science experiments with ANSTO scientists including the Cosmetic Chemistry, Water Rocket, Easter Egg and Water Science Workshops
- Fact or Fiction, a highly interactive and entertaining event for National Science Week
- Historical tours of the HIFAR reactor
- Sponsorship of the *2011-2012 Ultimate Science Guide*, a magazine supplement designed to encourage year 10, 11 and 12 students to consider a career in science
- Customised education tours in line with national curriculum.

ANSTO's Discovery Centre Team Leader, Rod Dowler, helping a young workshop participant launch her hand made water rocket.

Over 700 people attended four Fact or Fiction sessions held during National Science Week.

A series of extremely popular historical tours were run of ANSTO's HIFAR reactor.

Sponsorship and events

In 2011-12 ANSTO sponsored and awarded the inaugural Eureka Prize for Innovative Use of Technology to Dr Philip Dinning from Flinders University, and Dr John Arkwright of the CSIRO. ANSTO also continued its support for the Fulbright Scholarship in Nuclear Science and Technology.

ANSTO also supported community and industry events such as the Sutherland Shire Australia Day celebration, the Innovation Series events, the Four Societies Lecture, and the Australian Academy of Technological Sciences and Engineering (ATSE) Clunies Ross Awards.

ANSTO has continued to focus on education, supporting the National Youth Science Forum (NYSF), participating in the Australian Museum's Science Unleashed program, and sponsoring two high school students attending the International Science Olympiads.

Dr Adi Paterson (centre) with the winners of the inaugural ANSTO sponsored Innovative Use of Technology Eureka Award, CSIRO's (L-R) Dr John Arkwright and Flinders University's Dr Philip Dinning.

National Science Week in Perth on 8 August 2011 at Scitech, Western Australia.

ANSTO also supported key Australian and international conferences and workshops to increase the profile and awareness of the organisation's user access programs.

ANSTO's Distinguished Lecture Series ran for a second year. ANSTO hosted nine lectures aimed at providing a forum for esteemed scientists from across the world to address the general public and scientific community in Sydney. Visiting scientists included one of Australia's most distinguished molecular biologists and resident of the Australian Academy of Science, Professor Suzanne Cory, and global polymer science expert, Emeritus Professor Dame Julia Higgins.

John Dodson presenting at the Innovation Series in Sydney on 19 June 2012.

Businesses

External earnings by ANSTO business and commercial groups amounted to $63.9 million in 2011-12. This was up $12.9 million, being a 25.3 per cent increase on the previous 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 life saving 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 $28.2 million in 2011-12. This was up $0.95 million from the previous year.

ANSTO Health delivers a constantly reliable supply of the ANSTO Gentech® Generators to the Australian nuclear medicine community.

Export Low Enriched Uranium Mo-99

The Mo-99 produced by ANSTO is Low Enriched Uranium (LEU) + LEU (target plates + fuel), 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.

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 gain market share based on its value proposition of reliable supply of quality product.

PETNET's revenue earnings for 2011-12 were $2.5 million. This was up $1.2 million from the previous year.

PETNET's twin mini-cyclotrons produce radiopharmaceuticals used in positron emission tomography (PET).

ANSTO Minerals

ANSTO Minerals is a commercial consultancy group focussed on the uranium and rare earths sector. ANSTO has over 30 years' experience and expertise that includes chemical engineering, metallurgy, mineralogy, chemistry, geology and radiation safety.

ANSTO Minerals, a business unit of ANSTO, offers solutions and innovative technology including flow sheet design, bench testing and scale up pilot plant. These services delivered by ANSTO Minerals generate substantial financial and environmental benefits to mineral processing customers.

ANSTO Minerals revenue earnings for 2011-12 were $14.1 million. This was up $1.9 million from the previous year, due to continual commercial activities in uranium and rare earths by mining companies.

ANSTO Minerals provides commercial services and consulting advice to the minerals industry.

Neutron transmutation doping silicon

ANSTO silicon revenue earnings for 2011-12 were $4.8 million. This was up $0.8 million from the previous year. ANSTO silicon irradiation service has continued to grow sales by delivering high quality consistent irradiation of silicon ingots that are used in high end electronic devices such as a hybrid cars and high-speed trains.

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.

Membrane bioreactor and sewage treatment technology

Ground-breaking water cleansing technology developed at ANSTO was successfully commercialised and the intellectual property sold to Australian clean-tech company, BioGill Environmental Pty Ltd, a manufacturing company based in Sydney, in March.

The system has numerous industrial and environmental applications, including the treatment of grey water, sewage and wastewater from aquaculture, and food and beverage processing.

The technology is also considered to have great potential for cleaning water on ships, offshore platforms and remote islands where protecting sensitive environments is essential.

Partnerships and associations

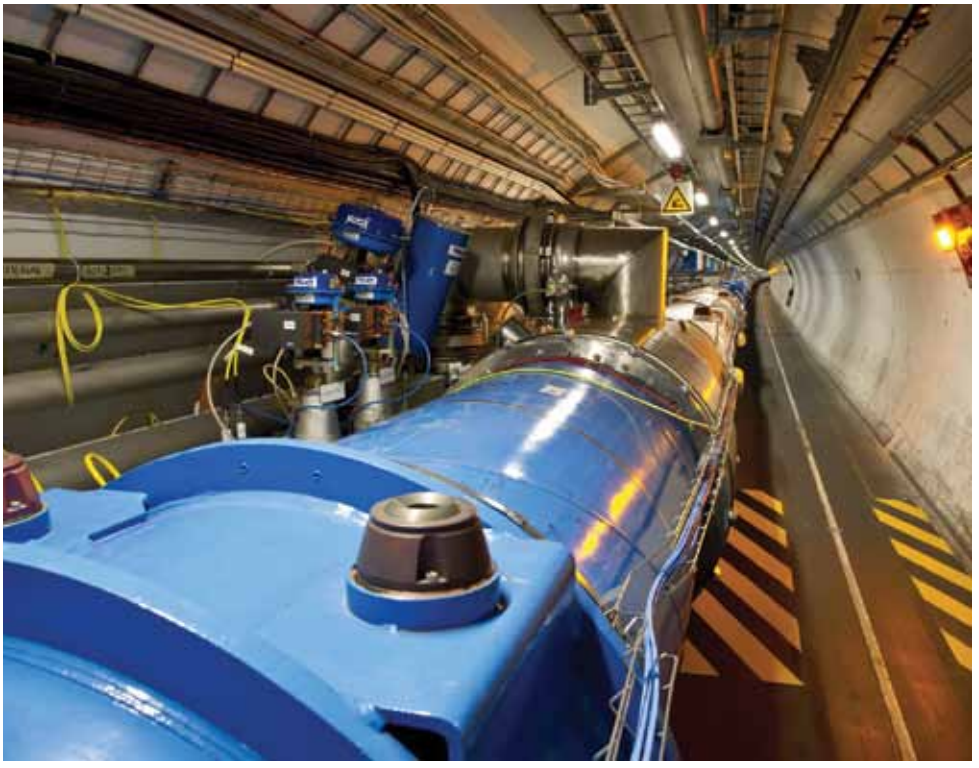
CERN (the European Organization for Nuclear Research)

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 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.



Inside the tunnel of CERN's Large Hadron Collider. Image courtesy of CERN.

Australian Synchrotron

Synchrotron radiation-based techniques are vital to a wide range of research fields including physics, chemistry, materials science, structural biology, polymer research, environmental science and geophysics.

Synchrotron radiation techniques are similar to neutron scattering techniques that require a reactor such as OPAL, and the results from each are often complementary. While each has its particular area of strength and uniqueness, there is significant overlap in the user communities in some scientific disciplines.

ANSTO is one of ten foundation investors in the Australian Synchrotron and has special access to it, averaging six days per year on each beam line. Proposals for this special access are internally reviewed by ANSTO.

ANSTO has used this beam time to perform strategic experiments; to initiate new projects; to conduct preliminary and pilot studies; for training and familiarisation of staff on new techniques; for a small molecule crystallography service; and to give increased time allocations to ANSTO proposals which have been submitted via the regular scientific merit system.

ANSTO researchers were awarded 53 days of beam time at the Australian Synchrotron, which is a substantial increase over the previous year (30 days awarded). ANSTO researchers made use of all nine Australian Synchrotron beam lines in this period.

The trend of increasing demand for the small angle X-ray scattering (SAXS) beam line, which has emerged in recent years, continued in 2011-12. This reflects the close complementarity of synchrotron SAXS with small angle X-ray scattering (SANS) at the Quokka instrument at OPAL, particularly in the field of structural biology where small angle scattering provides a unique capability of elucidating the structure of proteins in solution. ANSTO has entered a collaboration with the Australian Synchrotron and Monash University to augment the SAXS beam line by jointly funding the purchase of automated protein solution handling and analysis equipment. This will further enhance Australian capability, which is already world-class with the combination of the SAXS and SANS beam lines/instruments and the National Deuteration Facility.

The Australian Synchrotron's online proposal and user administration system was developed and continues to be maintained under contract by the Bragg Institute. This is a significant benefit to users of the synchrotron and the neutron scattering instruments at OPAL as both facilities run the same online user system.

ANSTO, the Australian Synchrotron, Monash University and other partners organise the annual 'Synchrotron and Neutron New Users Symposium' to educate potential new users about the landmark infrastructure available and the user-access programs at ANSTO's Bragg Institute and the Australian Synchrotron. The symposium is held in July each year, and alternates between Sydney and Melbourne, with the 2011 event having been held at the University of New South Wales.

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.

Japanese SPring-8 Centre

In late 2011, ANSTO signed a Memorandum of Understanding (MoU) with the Japanese SPring-8 Centre that will give Australian scientists access to a world leading fundamental physics facility – 'a free-electron laser'.

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

The MoU demonstrates the value of pooling Australia's top experts in accelerator science into one body known as ACAS. The agreement opens up opportunities for collaboration amongst Australian and overseas scientists to undertake reciprocal visits and facilitate greater co-operation.

University of Sydney

In September 2011, a re-signing of an MoU between ANSTO and the University of Sydney reinforced a productive scientific partnership. The renewed MoU enables scientists from the University of Sydney to continue research using OPAL and, in return, ANSTO will have access to experts and scientific facilities at the University, which ranks 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.

Monash University

Although ANSTO and Monash University have undertaken many individual research collaborations over the years, a new formal agreement was signed in late 2011 that 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.

Macquarie University

An agreement was signed this year between ANSTO and Macquarie University that will help 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. This arrangement is the first of its kind between the University and ANSTO.

The successful appointee will help lead work to replicate environments located 400 kilometres beneath 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.

Ludwig Institute for Cancer Research and Austin Health

In April, a partnership between ANSTO, the Ludwig Institute for Cancer Research and Austin Health saw a new, state-of-the-art Positron Emission Tomography (PET) Solid Targetry Laboratory opened. The lab will enable 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 will provide 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 will encourage knowledge transfer between ANSTO, Ludwig Institute for Cancer Research, Austin Hospital staff, and the Australian scientific community. This improved training will mean more patients can benefit from this innovative and highly effective technique to detect cancer.

US Radiopharmaceuticals

Under a new agreement reached in June,
Australian patients will benefit from a new collaboration announced between ANSTO and US Radiopharmaceuticals (USR).

The agreement will see USR supply ANSTO with vital diagnostic imaging isotopes for SPECT (single photon emission computed tomography) imaging as well as disease specific biomarkers.

This will provide a diversified supply of accelerator-based radioisotopes for Australian hospitals. SPECT isotopes are not currently manufactured in Australia and under this collaboration they will be produced at USR's high-energy accelerator facility in Texas, USA.

The isotopes offer improved 3D imaging of internal organs, as well as cardiac and brain function. SPECT, and hybrid SPECT/CT (computed tomography), procedures are growing in prevalence globally because of their effectiveness in detecting endocrine and neuroendocrine tumours, as well as lung cancer, brain tumours, lymphoma, breast and prostate cancer.

Capital investment

Numerous major construction projects were completed or underway at ANSTO in 2011-12. The new works will deliver highly improved scientific facilities and infrastructure. Some of the key constructions include:

- Environmental Radioactivity Measurement Centre – officially opened in April. This Centre is enabling our scientists to detect the tiniest amounts of radioactive material, amounts that would previously have been undetectable due to background radiation, and to monitor ANSTO's local environment. The Centre features new laboratories and office space and was built from materials with low background radiation levels to ensure interference does not occur during tests of low levels of radioactivity
- OPAL building extension – will better cater for needs of the reactor and enable increased radiopharmaceutical production to assist in alleviating the world shortage of molybdenum. The extension will include a two storey office, laboratories and workshops to accommodate 100 nuclear operations staff currently located in other areas across the Lucas Heights site. Construction is expected to be completed December 2012.

Construction of the OPAL building extension is well underway and expected to be completed by the end of 2012.

- Centre for Accelerator Science (CAS) - which will reinforce ANSTO's place at the forefront of accelerator mass spectrometry and ion beam analysis research, and provide our researchers, collaborators and users with two new accelerators in addition to ANTARES and STAR. The Centre, which is expected to be completed in early 2013, will also ensure Australia is able to support key research areas of national importance and act as a strong drawcard for Australian and international scientists.
- ANSTO Minerals Precinct Facilities - will allow the amount and scope of work by ANSTO Minerals, a successful ANSTO research and engineering business, to expand. Australia is in a minerals boom, and ANSTO Minerals plays a key role in keeping our minerals industry profitable through innovative technology solutions. Construction is expected to be complete by August 2012.
- Integrated Waste Management Facility – will improve operational efficiency through the consolidation of a number of operations into one location. In addition, a super compactor will be added that can further compress nuclear waste, reducing the volume of waste on site. Construction of the building was completed in March 2012 and complete fit out will be completed in the first quarter of 2012-13.

Performance against strategic objectives

Key Performance Indicators	2010-11	2011-12
Facility availability		
• Neutron Beam instruments - % days operated per days beamline availability	**83%**	**88%**
• Total availability of OPAL: % of days at power	**76%**	**80%**
• Planned availability of OPAL: % of actual operating to scheduled operating time	**90%**	**96%**
• Accelerators: average % of days operated per planned operation	**78%**	**80%**
Nuclear Science Facilities project		
• Percentage of capital funding completed	**48.4%**	**58.1%**[1]
Radiopharmaceutical doses		
• Potential Doses	**2,276,764**	**2,324,663**

[1] Actual expenditure was less than originally estimated for 2011-12 but in line with the Deed of Variation signed with DIISRTE during the financial year.

INDEPENDENT AUDITOR'S REPORT

To the Minister for Tertiary Education, Skills, Science and Research

I have audited the accompanying financial statements of the Australian Nuclear Science and Technology Organisation (ANSTO) for the year ended 30 June 2012, which comprises: the Statement by the Directors 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.

GPO Box 707 CANBERRA ACT 2601
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 2012 and of its financial performance and cash flows for the year then ended.

Report on Other Legal and Regulatory Requirements

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 the Organisation.

Australian National Audit Office

Kristian Gage
Audit Principal

Delegate of the Auditor-General

Canberra

15 August 2012

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 2012 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 2012

Adi Paterson
Chief Executive Officer
15 August 2012

Peter Arambatzis
Chief Financial Officer
15 August 2012

Consolidated statement of comprehensive income for the year ended 30 June 2012

	Notes	Consolidated 2012 $'000	2011 $'000
EXPENSES			
Employee benefits	6A	**114,702**	103,062
Suppliers expenses	6B	**55,670**	61,255
Depreciation and amortisation	6C	**84,073**	80,174
Write down and impairment of assets	6D	**108**	5,241
Grants	6E	**5,021**	6,225
Finance costs	6F	**12,490**	15,192
Foreign exchange losses	6G	**854**	696
Losses from asset sales	6H	**91**	3,151
TOTAL EXPENSES		**273,009**	274,996
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Sale of goods and rendering of services	5B	**69,988**	56,582
Interest	5D	**5,040**	7,357
Grants	5C	**1,674**	2,084
Total own-source revenue		**76,702**	66,023
Gains			
Gains from sale of assets	5E	**172**	270
Foreign exchange gains - non speculative	5F	**1,831**	832
Other revenue	5G	**79**	2,550
Total gains		**2,082**	3,652
Total Own-source income		**78,784**	69,675
Net cost of services		**194,225**	205,321
Revenue from Government	5A	**157,676**	165,592
(Deficit) before income tax on continuing operations		**(36,549)**	(39,729)
Income tax (expense) benefit	23	**1,200**	(345)
(Deficit) after income tax on continuing operations		**(35,349)**	(40,074)
(Deficit) after income tax		**(35,349)**	(40,074)
(Deficit) attributable to the Australian Government		**(35,349)**	(40,074)
OTHER COMPREHENSIVE INCOME			
Changes in asset revaluation reserves	10	**129,148**	10,652
Total other comprehensive income (deficit) after income tax		**93,799**	(29,422)
Total comprehensive income (deficit) attributable to the Australian Government		**93,799**	(29,422)

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

Consolidated balance sheet as at 30 June 2012

	Notes	Consolidated 2012 $'000	Consolidated 2011 $'000
ASSETS			
Financial assets			
Cash and cash equivalents	7A, 21	**3,411**	3,278
Trade and other receivables	7B, 21	**15,968**	11,727
Investments	7C, 21	**67,389**	115,268
Total financial assets		**86,768**	130,273
Non-financial assets			
Land and buildings	8A	**281,404**	209,164
Infrastructure, plant and equipment and major facilities	8B	**740,445**	696,513
Inventories	8C	**22,247**	15,629
Intangibles	8D	**20,800**	18,948
Tax assets	8E	**1,200**	-
Other non-financial assets	8E	**2,643**	7,255
Total non-financial assets		**1,068,739**	947,509
Total assets		**1,155,507**	1,077,782
LIABILITIES			
Payables			
Suppliers	9E, 21	**14,786**	11,383
Employees	9F, 21	**5,544**	3,836
Grants	9G, 21	**481**	687
Other	9H, 21	**1,480**	1,433
Total payables		**22,291**	17,339
Interest bearing liabilities			
Other	9A, 21	**52**	2,484
Total interest bearing liabilities		**52**	2,484
Provisions			
Employee provisions	9B	**31,373**	28,528
Decommissioning provision	9C	**263,011**	291,465
Other	9D	**45**	286
Total provisions		**294,429**	320,279
Total liabilities		**316,772**	340,102
Net assets		**838,735**	737,680
EQUITY			
Contributed equity	10	**489,356**	481,956
Reserves	10	**480,341**	350,809
Retained (deficit)	10	**(130,962)**	(95,085)
Total equity		**838,735**	737,680

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

Consolidated statement of cash flows for the year ended 30 June 2012

	Note	Consolidated 2012 $'000 Inflows (Outflows)	Consolidated 2011 $'000 Inflows (Outflows)
OPERATING ACTIVITIES			
Cash received			
Sales of goods and rendering of services		**70,162**	56,640
Interest		**5,376**	8,377
Receipts from Government		**157,676**	165,592
Total cash received		**233,214**	230,609
Cash used			
Employees		**(110,149)**	(99,000)
Suppliers		**(71,038)**	(81,201)
Total cash used		**(181,187)**	(180,201)
NET CASH FLOWS FROM OPERATING ACTIVITIES	11	**52,027**	50,408
INVESTING ACTIVITIES			
Cash received			
Proceeds from sale of property, plant and equipment		**1,483**	1,526
Proceeds from investment sales		**236,933**	173,525
Total cash received		**238,416**	175,051
Cash used			
Purchase of property, plant and equipment and intangibles		**(108,656)**	(81,511)
Loans to related parties		**-**	-
Purchase of investments		**(189,054)**	(159,793)
Total cash used		**(297,710)**	(241,304)
NET CASH USED BY INVESTING ACTIVITIES		**(59,294)**	(66,253)
FINANCING ACTIVITIES			
Cash received			
Appropriation - contributed equity		**7,400**	14,100
NET CASH FLOWS FROM FINANCING ACTIVITIES		**7,400**	14,100
NET INCREASE/(DECREASE) IN CASH HELD		**133**	(1,745)
Cash and cash equivalents at the beginning of the reporting period		**3,278**	5,023
Cash and cash equivalents at the end of the reporting period		**3,411**	3,278

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

Consolidated statement of changes in equity for the year ended 30 June 2012

	Consolidated					
	Retained Deficit		Asset Revaluation Reserve		Other Reserves	
	2012 $'000	2011 $'000	**2012 $'000**	2011 $'000	**2012 $'000**	2011 $'000
Opening Balance	**(95,085)**	(58,404)	**339,108**	328,456	**11,701**	14,902
Foreign currency translation	**-**	-	**-**	-	**(144)**	201
Revaluation increment	**-**	-	**129,148**	10,652	**-**	-
Other	**-**	-	**-**	-	**-**	(139)
Deficit for the period	**(35,349)**	(40,074)	**-**	-	**-**	-
Total comprehensive income	**(35,349)**	(40,074)	**129,148**	10,652	**(144)**	62
Contributions by Owners						
Appropriation (equity injection)	**-**	-	**-**	-	**-**	-
Sub-total Transactions with Owners	**-**	**-**	**-**	**-**	**-**	**-**
Transfers between equity components	**(528)**	3,393	**-**	-	**528**	(3,263)
Closing balance as at 30 June	**(130,962)**	(95,085)	**468,256**	339,108	**12,085**	11,701
Closing balance attributable to Australian Government	**(130,962)**	(95,085)	**468,256**	339,108	**12,085**	11,701

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 2012

	Consolidated			
	Contributed Equity/Capital		Total Equity	
	2012 $'000	2011 $'000	**2012 $'000**	2011 $'000
Opening Balance	**481,956**	467,856	**737,680**	752,810
Foreign currency translation	**-**	-	**(144)**	201
Revaluation increment	**-**	-	**129,148**	10,652
Other	**-**	-	**-**	(139)
Deficit for the period	**-**	-	**(35,349)**	(40,074)
Total comprehensive income	**-**	-	**93,655**	(29,360)
Contributions by Owners				
Appropriation (equity injection)	**7,400**	14,100	**7,400**	14,100
Sub-total Transactions with Owners	**7,400**	14,100	**7,400**	14,100
Transfers between equity components	**-**	-	**-**	130
Closing balance as at 30 June	**489,356**	481,956	**838,735**	737,680
Closing balance attributable to Australian Government	**489,356**	481,956	**838,735**	737,680

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

Consolidated schedule of commitments not recognised as liabilities as at 30 June 2012

	Notes	Consolidated 2012 $'000	2011 $'000
BY TYPE			
Commitments receivable			
Other commitments receivable			
GST recoverable from Australian Taxation Office on Commitments		**7,972**	6,290
Total other commitments receivable		**7,972**	6,290
Commitments payables			
CAPITAL COMMITMENTS			
Infrastructure, plant and equipment		**71,972**	67,944
Total capital commitments		**71,972**	67,944
OTHER COMMITMENTS			
Replacement Research Reactor Project (OPAL)	(a)	**3,093**	6,786
Operating lease	(b)	**1,725**	1,862
Fuel elements purchase		**9,693**	1,242
Mo-99 plates purchase		**6,024**	901
Total other commitments		**20,535**	10,791
Net commitments by type		**84,535**	72,445
BY MATURITY			
Capital commitments payable			
One year or less		**8,581**	22,693
From one to five years		**63,391**	45,251
		71,972	67,944
OTHER COMMITMENTS			
One year or less		**12,022**	9,066
From one to five years		**7,610**	685
Over five years		**903**	1,040
Total other commitments		**20,535**	10,791
Other commitments receivable			
One year or less		**2,209**	2,176
From one to five years		**5,763**	4,114
		7,972	6,290
Net commitments by maturity		**84,535**	72,445

(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 $3.093 million (2011: $6.786 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 (2011: $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 schedule should be read in conjunction with the accompanying notes.

Schedule of contingencies as at 30 June 2012

Unquantifiable Contingencies

At 30 June 2012, 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 2011/2012 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 2012

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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 2011-12 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 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 2011; and
- Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards 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 executor 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.

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.

(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 chief executive 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 chief executive 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 chief executive 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 chief executive 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 Department of Innovation, Industry, Science and Research (DIISR) (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.

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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 2012 amounted to $10,759 (2011: nil).

(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 1 staff (2011: 5) amounted to $25,000 (2011: $436,000).

(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 2012 were 17.8% (2011 14.4%) of salary (PSS), 16.9% (2011 17.0%) of salary (CSS), and 15.4% (2011 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.

(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 recogniti on.

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 orloss. 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.

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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 asoutlined 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
Buildings	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.

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:

	2012	2011
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.

Impairment
All assets were assessed for impairment at 30 June 2012. 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 dependenton 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
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.

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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

Amortisation rates applying to intangibles are as follows:

	2012	2011
Purchased software	**2 - 7 years**	2 - 7 years
Licences	**3 years**	3 years

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

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 2012. 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 2012 there were 208 patents, trademarks, design and applications (212 at 30 June 2011) registered to ANSTO and no associated costs are recognised as an asset (nil at 30 June 2011).

(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.

(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.

ANSTO Inc, a USA company, is subject to US tax laws. No Deferred Tax Asset has been recognised at 30 June 2012 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 $52 thousand (2011: $1,047 thousand) The total deferred tax assets recognised in relation to PETNET Australia Pty Ltd for 30 June 2012 is $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 or (ii) a requirement for ANSTO to operate in the industry as in the case of ANSTO Inc., an operation in the U.S.A..

(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 2012

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	
	2012	2011
	$'000	$'000
Operating revenues		
Revenue from Government	**157,676**	165,592
Sale of goods and services	**69,988**	56,582
Interest	**5,040**	7,357
Net gain from sale of assets	**172**	270
Other	**3,584**	5,466
Income tax benefits	**1,200**	-
Total operating revenues	**237,660**	235,267
Operating expenses		
Employees	**114,702**	103,062
Suppliers	**55,670**	61,255
Depreciation and amortisation	**84,073**	80,174
Finance costs	**12,490**	15,192
Write-down and impairment of assets	**108**	5,241
Other	**5,966**	10,417
Total operating expenses	**273,009**	275,341

Major Classes of Departmental Assets and Liabilities by Outcome - Consolidated

	Consolidated	
	2012	2011
	$'000	$'000
Assets		
Cash and cash equivalents	**3,411**	3,278
Trade and other receivables	**15,968**	11,727
Investments	**67,389**	115,268
Land and buildings	**281,404**	209,164
Infrastructure, plant and equipment	**740,445**	696,513
Inventories	**22,247**	15,629
Intangibles	**20,800**	18,948
Tax assets	**1,200**	-
Other	**2,643**	7,255
Total assets	**1,155,507**	1,077,782
Suppliers	**14,786**	11,383
Employees payables	**5,544**	3,836
Grants	**481**	687
Other payables	**1,480**	1,433
Interest bearing liabilities	**52**	2,484
Employee provisions	**31,373**	28,528
Decommissioning provision	**263,011**	291,465
Other provisions	**45**	286
Total liabilities	**316,772**	340,102

Notes:

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

		Notes	Consolidated 2012 $'000	Consolidated 2011 $'000
5	**Own-source revenue**			
5A.	**Revenue from Government**			
	CAC Act payments from DIISRTE		**157,676**	165,592
5B.	**Sale of goods and rendering of services**			
	Radioisotope sales		**27,876**	27,176
	Services and contract research		**30,668**	18,699
	Silicon irradiation		**5,193**	4,310
	CSIRO site support		**1,210**	1,218
	Training courses		**260**	303
	Land management		**3,422**	3,420
	Australian Synchrotron Research Project		**-**	15
	AINSE interactions		**1,359**	1,441
	Total sales of goods and rendering of services		**69,988**	56,582
5C.	**Grants**		**1,674**	2,084
5D.	**Interest - Bank**		**5,040**	7,357
5E.	**Gains from sale of assets**			
	Proceeds from sale of assets		**687**	813
	Carrying value of assets sold		**(515)**	(543)
	Gain from disposal of infrastructure, plant and equipment		**172**	270
5F.	**Foreign exchange gains - non speculative**		**1,831**	832
5G.	**Other revenue:**			
	Other		**79**	2,550
	Total other revenue		**79**	2,550
	Total own-source revenue		**78,784**	69,675
	Total revenues from ordinary activities		**236,460**	235,267
5H.	**Sales of goods and rendering of services**			
	Goods		**27,876**	27,176
	Services		**42,112**	29,406
	Total sales of goods and rendering of services	5B	**69,988**	56,582
	Provision of goods to:			
	External entities		**27,876**	27,176
	Total sales of goods		**27,876**	27,176
	Rendering of services to:			
	Related entities		**1,822**	1,324
	External entities		**40,290**	28,082
	Total rendering of services		**42,112**	29,406

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

			Consolidated	
			2012	2011
6	**Expenses**	Notes	$'000	$'000
	The breakdown of operating expenses is:			
6A.	**Employee benefits:**			
	Wages and salaries		**86,628**	76,671
	Superannuation		**16,111**	14,776
	Leave and other entitlements		**11,947**	10,578
	Separation and redundancy		**16**	1,037
	Total employee benefits		**114,702**	103,062
	Workers compensation premiums		**-**	-
	Total employee benefits		**114,702**	103,062
6B.	**Supplier expenses:**			
	Goods from related entities		**-**	-
	Goods from external entities		**33,501**	28,491
	Services from related entities		**25,895**	22,332
	Workers compensation premiums - related		**806**	1,042
	Services from external entities		**4,532**	9,187
	Operating lease rentals - external		**-**	203
	Total supplier expenses		**55,670**	61,255
6C.	**Depreciation and amortisation**			
	Depreciation of property, plant and equipment (a)	8B	**77,327**	70,736
	Impairment of property, plant and equipment (a)	8B	**-**	3,711
	Amortisation of intangible assets - licence	8D	**72**	30
	Amortisation of intangible assets - software	8D	**6,674**	5,697
	Total depreciation and amortisation		**84,073**	80,174
6D.	**Write-down and impairment of assets**			
	Financial assets:			
	Receivables for goods and services		**108**	3
	Write-down of investment		**-**	5,000
	Non financial assets:			
	Materials - write off obsolete stock		**-**	238
	Total write-down of assets		**108**	5,241
6E.	**Grants**		**5,021**	6,225
6F.	**Finance costs**			
	Unwinding of discount on decommissioning costs		**12,298**	15,087
	Interest		**192**	105
			12,490	15,192
6G.	**Foreign exchange losses**			
	Foreign exchange loss - non speculative			
	-realised		**765**	347
	-unrealised		**89**	349
			854	696
6H.	**Losses from asset sales**			
	Proceeds from sale of assets		**796**	1,095
	Carrying values of assets sold		**(887)**	(4,246)
	Total losses from asset sales		**91**	3,151

(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	**1,428**	4,565
Plant and equipment	**47,811**	38,622
Infrastructure	**2,645**	2,815
National and major facilities	**25,443**	28,445
	77,327	74,447
Less: Impairment	**-**	(3,711)
Total depreciation and amortisation	**77,327**	70,736

		Consolidated	
		2012	2011
		$'000	$'000
7	**Financial assets**		
7A.	**Cash and cash equivalents**		
	Cash on hand or on deposit	**3,411**	3,278
	Total cash and cash equivalents	**3,411**	3,278
7B.	**Trade and other receivables**		
	Goods and services (a)		
	Goods and services - related entities	**258**	297
	Goods and services - external parties	**14,101**	9,250
	Total receivables for goods and services	**14,359**	9,547
	Other receivables		
	Interest accrued	**292**	628
	Reimbursable foreign exchange loss	**-**	-
	Other	**848**	768
	Loans to related parties	**-**	-
	GST receivable from the Australian Taxation Office	**577**	787
	Total other receivables (a)	**1,717**	2,183
	Less impairment allowance account:		
	Goods and services	**108**	3
	Total impairment allowance (b)	**108**	3
	Total trade and other receivables (net)	**15,968**	11,727
	Receivable are expected to be recovered in:		
	No more than 12 months	**14,336**	11,727
	More than 12 months	**1,632**	-
	Total trade and other receivable (net)	**15,968**	11,727

(a) **Total receivables are aged as follows:**

Age analysis of trade and other receivables (net)		
Current	**7,881**	7,182
Overdue:		
Less than 30 days	**2,739**	1,991
30 to 60 days; and	**196**	721
60 to 90 days	**-**	763
More than 90 days	**5,152**	1,070
Total receivables (gross)	**15,968**	11,727

(b) The provision for doubtful debts represents certain debts aged more than 90 days (2011: aged more than 90 days).

The Impairment allowance is aged as follows:		
Age analysis of trade debtors		
More than 90 days	**108**	3
Total impairment allowance account	**108**	3

Reconciliation of the Impairment Allowance Account:

Opening Balance	**3**	15
Amount provided	**108**	3
Amount recovered and reversed	**(3)**	(15)
Closing Balance	**108**	3

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

	Consolidated	
	2012	2011
	$'000	$'000
7C. Investments		
Bank bills	**58,500**	108,000
Treasury Bonds	**-**	-
Term deposit	**8,889**	7,268
Investment in Australian Synchrotron (a)	**-**	-
Investment in PETNET Australia Pty Limited	**-**	-
Total investments	**67,389**	115,268

(a) The investment in Australian Synchrotron Holding Company (ASHCo) of $5 million was assessed as requiring impairment testing. Due to significant uncertainty regarding future funding, the decision was taken in 2011 that the investment be impaired.

7D. Investment in subsidiaries

The details of the subsidiaries of ANSTO are:

Name	Place of Incorporation	% Owned	Investment		Loan/Convertible Notes	
			2012	2011	**2012**	2011
			$	$	**$**	$
ACN 120 875 498 Pty Limited (formerly Australian Membrane Technologies Pty Limited)	Australia	100%	**1**	1	**-**	-
PETNET Australia Pty Ltd	Australia	100%	**14,457,588**	13,627,588	**-**	-
ANSTO Inc.	Delaware U.S.A.	100%	**-**	**-**	**-**	-
			14,457,589	13,627,589	**-**	-

ANSTO Inc. was incorporated in Delaware, USA on 27 October 1999. At 30 June 2012: US$100 (2011: 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.

The loan to ANSTO Inc., $US1,870,118 (2011: $US1,470,118) was considered impaired and hence fully provided as at 30 June 2012 in the parent entity due. to ANSTO Inc.'s net assets deficiency and unlikely ability to repay the loan.

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 14.16% (2011, 13.81%) and 14 years (2011,15 years) cash flow plus the value of cash on hand (surplus asset) was $14,458 thousand (2011, $13,628 thousand) compared to a carrying value of the investment of $13,628 thousand (2011, $17,228), giving a write up of $830 thousand (2011, impairment of $3,600 thousand).

For the financial year ended 30 June 2012, 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 2012 ANSTO's investment was carrying value of investment: US$400 (2011: US$200). Element 42 LLC has not traded.

7F. Investment - other

Name	Place of Incorporation	% Owned	Investment	
			2012	2011
			$	$
Clarity Pharmaceuticals Pty Ltd	Australia	5%	**-**	**-**
Advance Polymetrik	Australia	4%	**-**	**-**
			-	**-**

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

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

		Consolidated 2012 $'000	2011 $'000
8	**Non-financial assets**		
8A.	**Land and buildings**		
	Land - 30 June fair value	**97,200**	78,700
		97,200	78,700
	Buildings - 30 June fair value	**148,858**	142,039
	Less accumulated depreciation	**9,144**	37,395
		139,714	104,644
	Building under construction	**44,490**	25,820
	Total buildings	**184,204**	130,464
	Total land and buildings	**281,404**	209,164
8B.	**Infrastructure, plant and equipment and major facilities**		
	8B(i). Plant and equipment		
	Plant and equipment - 30 June fair value	**294,808**	336,232
	Less accumulated depreciation	**107,820**	130,480
		186,988	205,752
	Plant and equipment under construction	**93,201**	52,826
	Total plant and equipment	**280,189**	258,578
	8B(ii). Infrastructure		
	Electrical/site services facilities - 30 June fair value	**28,248**	29,728
	Less accumulated depreciation	**-**	10,289
		28,248	19,439
	Total infrastructure	**28,248**	19,439

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

8 Non-financial assets (continued)

	Consolidated 2012 $'000	2011 $'000
8B(iii). Major national and major research facilities		
Major national research facilities - 30 June fair value	7,128	7,795
Less accumulated depreciation	-	1,070
	7,128	6,725
Major research facilities- 30 June fair value	6,122	6,597
Less accumulated depreciation	-	2,887
	6,122	3,710
OPAL nuclear research reactor - 30 June fair value	418,802	457,937
Less accumulated depreciation	44	49,876
	418,758	408,061
Total major national and major research facilities	432,008	418,496
Total infrastructure, plant and equipment and major facilities	740,445	696,513
Total land, buildings, infrastructure, plant and equipment and major facilities	1,021,849	905,677

Movement summary 2011-2012 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

Movement summary 2010-2011 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 2010	78,700	150,640	229,340	815,011	1,044,351
Additions - new assets	-	16,757	16,757	54,558	71,315
Decommissioning Cost	-	1,553	1,553	25,942	27,495
Transfers/reclassifications	-	(1,091)	(1,091)	1,556	465
Disposals	-	-	-	(5,952)	(5,952)
Gross value as at 30 June 2011	78,700	167,859	246,559	891,115	1,137,674
Accumulated depreciation/ amortisation 1 July 2010	-	32,830	32,830	126,356	159,186
Depreciation/amortisation	-	4,565	4,565	66,171	70,736
Impairment	-	-	-	3,711	3,711
Adjustment for disposals	-	-	-	(1,636)	(1,636)
Accumulated depreciation/ amortisation 30 June 2011	-	37,395	37,395	194,602	231,997
Net book value as at 30 June 2011	78,700	130,464	209,164	696,513	905,677

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	
	2012	2011
	$'000	$'000
8C. Inventories		
Raw materials and stores-not held for resale		
Stores - at cost	**9,757**	1,778
Cobalt-60 sources - at net realisable value	**188**	215
Reactor fuel and heavy water - at average purchase price	**11,220**	13,215
Nuclear materials - at net realisable value	**-**	-
Provision for stock diminution	**(17)**	(95)
	21,148	15,113
Work in progress - at cost	**562**	237
Finished goods - at cost	**537**	279
Total inventories	**22,247**	15,629
8D. Intangibles		
Licences at cost	**1,224**	1,224
Less accumulated amortisation	**1,111**	1,039
	113	185
Design fees at cost	**1,562**	1,882
Less accumulated amortisation	**357**	398
	1,205	1,484
Intellectual property at cost	**1,125**	-
Less accumulated amortisation	**-**	-
	1,125	**-**
Software at cost	**35,217**	32,603
Less accumulated amortisation	**26,052**	19,659
	9,165	12,944
Software under construction	**9,192**	4,335
Total intangibles	**20,800**	18,948

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

Movement summary 2011-2012 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

Movement summary 2010-2011 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 2010	1,009	467	-	29,310	30,786
Additions - new assets	215	1,415	-	8,566	10,196
Transfer/Reclassification	-	-	-	(465)	(465)
Disposals	-	-	-	(473)	(473)
Gross value as at 30 June 2011	1,224	1,882	-	36,938	40,044
Accumulated depreciation/ amortisation 1 July 2010	1,009	104	-	14,256	15,369
Depreciation/amortisation	30	294	-	5,403	5,727
Accumulated depreciation/ amortisation 30 June 2011	1,039	398	-	19,659	21,096
Net book value as at 30 June 2011	185	1,484	-	17,279	18,948

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.

	FINANCIAL YEAR Consolidated	
	2012	2011
	$'000	$'000
Other non-financial assets		
Deferred tax asset	1,200	-
Prepayments	2,643	7,255
	3,843	7,255

		Consolidated	
9	**Liabilities**	**2012**	2011
		$'000	$'000
9A.	**Interest bearing liabilities**		
	Other (a)	**52**	2,484
	Total interest bearing liabilities	**52**	2,484
	Provision		
9B.	**Employee provisions**		
	Annual leave	**11,202**	10,267
	Long service leave	**20,171**	18,261
		31,373	28,528
	Employee provisions are expected to be settled in:		
	No more than 12 months	**5,544**	3,836
	More than 12 months	**25,829**	24,692
	Total employee provisions	**31,373**	28,528
9C	**Decommissioning provisions**		
	Decommissioning cost (c)	**263,011**	291,465
		263,011	291,465
9D	**Other**		
	Other claims (b)	**45**	286
		45	286
	Total provision	**294,429**	320,279
	Payables		
9E	**Suppliers**		
	Trade creditors	**14,786**	11,383
	Total suppliers	**14,786**	11,383
	Supplier payables expected to be settled within 12 months		
	Related entities	**8**	-
	External parties	**14,778**	11,383
	Total suppliers	**14,786**	11,383
9F	**Employees**		
	Accrued salaries and wages	**2,980**	2,819
	Redundancy payment	**25**	-
	Incentives	**2,539**	1,017
		5,544	3,836
9G	**Grants**		
	Non-profit entities	**481**	687
		481	687
9H	**Other**		
	Revenue received in advance	**1,480**	1,433
		1,480	1,433
	Total payables	**22,291**	17,339

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 & equipment and infrastructure and local and overseas legacy waste and current OPAL waste disposition.

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

9I Provision movement reconciliation

	Provision for Decommissioning Costs	Provision for Other Claims	Total Provisions
	$'000	$'000	$'000
Carrying amount 1 July 2010	**269,517**	**270**	**269,787**
Provisions not required	**(3,909)**	**-**	**(3,909)**
Additional provisions made	**27,498**	**16**	**27,514**
Amounts used	**(8,964)**	**-**	**(8,964)**
Change in accounting estimate	**(7,764)**	**-**	**(7,764)**
Unwinding discount	**15,087**	**-**	**15,087**
Closing balance 30 June 2011	**291,465**	**286**	**291,751**
Carrying amount 1 July 2011	**291,465**	**286**	**291,751**
Provisions not required	**(2,893)**	**(241)**	**(3,134)**
Additional provisions made	**4,981**	**-**	**4,981**
Amounts used	**(5,273)**	**-**	**(5,273)**
Change in accounting estimate	**(37,567)**	**-**	**(37,567)**
Unwinding discount	**12,298**	**-**	**12,298**
Closing balance 30 June 2012	**263,011**	**45**	**263,056**

	Consolidated	
	2012	2011
	$'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	**96,120**	82,020
Equity injections from Government	**7,400**	14,100
Balance 30 June	**103,520**	96,120
Total contributed equity	**489,356**	481,956
Reserves, including movements		
Asset revaluation reserve		
Balance 1 July	**339,108**	328,456
Revaluation adjustment	**129,148**	10,652
Balance 30 June	**468,256**	339,108
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	**567**	939
Transferred to retained deficit (b)	**(339)**	(372)
Balance 30 June	**228**	567
Nuclear & radiological security reserve		
Balance 1 July	**-**	539
Transferred to retained deficit (c)	**-**	(539)
Balance 30 June	**-**	-
Low Dose Nuclear Waste Repository		
Balance 1 July	**1,074**	4,211
Transferred to retained deficit (d)	**-**	(3,137)
Balance 30 June	**1,074**	1,074
Intermediate low level waste (ILLW) return		
Balance 1 July	**785**	-
Transferred from retained deficit (e)	**867**	785
Balance 30 June	**1,652**	785
Foreign currency reserve		
Balance 1 July	**214**	13
Movement (f)	**(144)**	201
Balance 30 June	**70**	214
Other reserve		
Balance 1 July	**-**	139
Movement (g)	**-**	(139)
Balance 30 June	**-**	-
Total reserves	**480,341**	350,809

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

		Consolidated	
		2012	2011
		$'000	$'000
10 Equity (continued)			
Retained deficit			
Retained deficit 1 July		**(95,085)**	(58,404)
Transfer from regional security of radioactive reserve	(b)	**339**	372
Transfer from nuclear & radiological security reserve	(c)	**-**	539
Transfer from Low Dose Nuclear Waste Repository	(d)	**-**	3,137
Transfer to Intermediate low level waste (ILLW) return	(e)	**(867)**	(785)
Transfer to other reserve		**-**	139
Transfer to foreign currency reserve		**-**	(9)
(Deficit)		**(35,349)**	(40,074)
Retained deficit 30 June		**(130,962)**	(95,085)
Total equity		**838,735**	737,680

(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) Nuclear and radiological security reserve
This reserve relates to funding which started in 2009-10 and will run through up to 2010-11.

(d) 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 agencie

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

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

(g) Other reserves
This reserve relates to ANSTO Inc. deferred tax assets.During 2010/11 the balance of this reserve was transferred to retained surplus.

11 Cash flow reconciliation

	Notes	Consolidated 2012 $'000	2011 $'000
Reconciliation of Operating Surplus (Deficit) to Net Cash from Operating Activities:			
Operating (deficit)		**(35,349)**	(40,074)
Non-cash items			
Depreciation/amortisation		**84,073**	80,174
Net write-down of Investment		**-**	5,000
Net loss on disposal of non-financial assets		**1,262**	3,264
Write off obsolete stock			
Nuclear materials devaluation		**-**	-
Unrealised foreign exchange (gain) loss		**89**	349
Net loss from sale of assets		**-**	-
Unwinding of Discount - decommissioning costs		**50,098**	15,087
Loss on sale of subsidiary		**-**	-
Changes in assets and liabilities			
(Increase) in trade goods and services receivables		**(4,710)**	(3,128)
(Increase)/Decrease in other receivables		**(80)**	(297)
(Increase)/Decrease in GST receivables		**210**	(277)
(Increase)/Decrease in accrued interest		**336**	1,020
Foreign exchange (gain)			
(Increase) in prepayments		**4,612**	(1,029)
(Increase) in inventories		**(6,618)**	(1,845)
(Decrease) in provision for waste treatment and disposal		**-**	-
Increase/(Decrease) in payables		**3,314**	(1,545)
Increase in employee entitlements		**4,553**	4,062
Increase in revenue received in advance		**(159)**	1
Increase/(Decrease) in deferred income tax		**(1,200)**	433
Increase/(Decrease) in reserves		**-**	16,560
Increase/(Decrease) in other provision		**(241)**	16
Increase/(Decrease) in decommissioning cost provision		**(45,731)**	(26,350)
Increase/(Decrease) in interest bearing liabilities		**(2,432)**	(1,013)
Net cash from operating activities		**52,027**	50,408

12 Government funding

Revenue from Government		**157,676**	165,592
Government equity injection		**1,400**	4,100
Education Investment Fund equity injection		**6,000**	10,000
		165,076	179,692

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

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

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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	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
J Hearn	1 May 2008	30 April 2012	
E Smyth	12 December 2008		11 December 2012
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 2011-2012 financial year the aggregate remuneration paid to members of the Board is disclosed in Note 14.

14 Remuneration of members of the Board

	Consolidated	
	2012	2011
The number of non-executive directors of ANSTO included in these figures are shown below in the relevant remuneration bands:	**Number**	Number
Remuneration between		
$0 to $29,999	**1**	1
$30,000 to $59,999	**7**	8
$60,000 to $89,999	**1**	-
$120,000 to $149,999	**-**	-
Total	**9**	9
Total remuneration received or due and receivable by directors of the entity	**320,231**	309,912

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

15 Remuneration of senior executives

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

	Consolidated	
	2012	2011
	$	$
Short-term employee benefits:		
Salary	**4,056,901**	3,643,618
Annual leave accrued	**276,682**	254,544
Performance bonuses	**454,188**	534,100
Motor vehicle and other allowance	**53,492**	66,107
Total short-term employee benefits	**4,841,263**	4,498,369
Post-employment benefits:		
Superannuation	**578,378**	593,088
Total post-employment benefits	**578,378**	593,088
Other long-term benefits:		
Long-service leave	**115,089**	89,839
Total other long-term benefits	**115,089**	89,839
Termination benefits	**-**	-
Total	**5,534,730**	5,181,296

Notes:

1. Note 15A was prepared on an accrual basis (so the performance bonus expenses disclosed above differ from the cash 'Bonus paid' in Note 15B).

2. Note 15A excludes acting arrangements and part-year service where remuneration expensed for a senior executive was less than $150,000.

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 2012					
Average annual reportable remuneration[1]	**Senior Executives No.**	**Reportable salary[2&6] $**	**Contributed Superannuation[3] $**	**Reportable allowances[4] $**	**Bonus paid[5] $**	**Total $**
Total remuneration (including part-time arrangements):						
less than $150,000	**5**	**78,421**	**12,505**	**-**	**5,352**	**96,278**
$150,000 to $179,999	**1**	**135,562**	**20,877**	**-**	**-**	**156,439**
$180,000 to $209,999	**-**	**-**	**-**	**-**	**-**	**-**
$210,000 to $239,999	**1**	**162,485**	**27,641**	**11,433**	**9,835**	**211,394**
$240,000 to $269,999	**2**	**190,190**	**40,826**	**-**	**33,300**	**264,316**
$270,000 to $299,999	**3**	**222,664**	**35,712**	**-**	**27,463**	**285,839**
$300,000 to $329,999	**3**	**216,402**	**51,259**	**-**	**42,686**	**310,347**
$330,000 to $359,999	**1**	**259,532**	**28,682**	**-**	**51,376**	**339,590**
$360,000 to $389,999	**1**	**300,397**	**33,306**	**-**	**47,431**	**381,134**
$450,000 to $479,999	**-**	**-**	**-**	**-**	**-**	**-**
$480,000 to $509,999	**1**	**383,663**	**59,107**	**-**	**60,919**	**503,689**
Total	**18**					

	Consolidated as at 30 June 2011					
Average annual reportable remuneration[1]	Senior Executives No.	Reportable salary[2] $	Contributed Superannuation[3] $	Reportable allowances[4] $	Bonus paid[5] $	Total $
Total remuneration (including part-time arrangements):						
less than $150,000	5	54,670	13,273	-	300	68,243
$150,000 to $179,999	-	-	-	-	-	-
$180,000 to $209,999	2	152,884	28,480	-	13,713	195,077
$210,000 to $239,999	6	166,128	41,472	4,804	22,869	235,273
$240,000 to $269,999	1	227,582	33,038	-	-	260,620
$270,000 to $299,999	3	223,298	41,172	-	15,833	280,303
$300,000 to $329,999	1	277,077	41,787	-	5,950	324,814
$330,000 to $359,999	-	-	-	-	-	-
$360,000 to $389,999	-	-	-	-	-	-
$450,000 to $479,999	1	347,314	62,050	-	67,540	476,904
$480,000 to $509,999						
Total	19					

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

Notes

1. This table reports substantive senior executives who received remuneration during the reporting period. Each row is an averaged figure based on
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' to account for tax benefits); and
3. The 'contributed superannuation' amount is the average actual superannuation contributions paid to senior executives in that reportable remuneration band during the reporting period, including any salary sacrificed amounts, as per the individuals' payslips.
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
6. Various salary sacrifice arrangements were available to senior executives including superannuation, motor vehicle and expense payment fringe benefits. Salary sacrifice benefits are reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'contributed superannuation' column.

Note 15C: Other Highly Paid Staff

	Consolidated as at 30 June 2012					
Average annual reportable remuneration[1]	**Staff No.**	**Reportable salary[2&6] $**	**Contributed Superannuation[3] $**	**Reportable allowances[4] $**	**Bonus paid[5] $**	**Total $**
Total remuneration (including part-time arrangements):						
$150,000 to $179,999	**54**	**136,346**	**24,005**	**28**	**2,630**	**163,009**
$180,000 to $209,999	**16**	**150,308**	**31,447**	**-**	**13,228**	**194,983**
$210,000 to $239,999	**1**	**181,718**	**29,028**	**-**	**27,100**	**237,846**
$240,000 to $269,999	**1**	**251,053**	**15,775**	**-**	**-**	**266,828**
$270,000 to $299,999	**1**	**217,952**	**41,556**	**-**	**23,300**	**282,808**
Total	**73**					

	Consolidated as at 30 June 2011					
Average annual reportable remuneration[1]	Staff No.	Reportable salary[2] $	Contributed Superannuation[3] $	Reportable allowances[4] $	Bonus paid[5] $	Total $
Total remuneration (including part-time arrangements):						
$150,000 to $179,999	36	136,405	23,570	1	2,029	162,005
$180,000 to $209,999	7	159,792	21,403	-	7,786	188,981
$210,000 to $239,999	3	181,160	26,642	-	10,167	217,969
$240,000 to $269,999	2	226,919	26,603	-	2,500	256,022
$270,000 to $299,999	-	-	-	-	-	-
Total	48					

Notes

1. This table reports staff:
   a) who were employed by the entity during the reporting period;
   b) whose reportable remuneration was $150,000 or more for the financial period; and
   c) were not required to be disclosed in Tables A, 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' to account for tax benefits); and
   c) exempt foreign employment income.
3. The 'contributed superannuation' amount is the average actual superannuation contributions paid to senior executives in that reportable remuneration band during the reporting period, including any salary sacrificed amounts, as per the individuals' payslips.
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.
6. Various salary sacrifice arrangements were available to other highly paid staff including superannuation, motor vehicle and expense payment fringe benefits. Salary sacrifice benefits are reported in the 'reportable salary' column, excluding salary sacrificed superannuation, which is reported in the 'contributed superannuation' column.

16 OPAL Nuclear Research Reactor

In the 2011-2012 financial year, the OPAL research reactor operated for 294 days at high power, which translates to a total availability of 80 per cent and a planned availability against the schedule of 96%. There has been a steady improvement in reactor availability over the early years of operation, with the latest result being amongst the highest in the world for research reactors.

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 unavailable for about 20 per cent of the year. Further major rectification work is planned for this system in 2012-2013.

The commissioning of the Heavy Water Upgrade System was completed, and the heavy water purity was increased to near optimum levels, which will assist with improved production efficiency.

ANSTO plans to operate the reactor for about 270 days in 2012-2013. A six-week major shutdown is planned to commence in November 2012, to install a major new beam line for neutron scattering science purposes.

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	
	2012	2011
	$	**$**
Audit fees in relation to the financial statements for the reporting period	**168,500**	167,500
Grant audits	**5,000**	10,000
	173,500	177,500

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

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	
	2012	2011
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.	**$'000**	$'000
Balance 1 July	**7**	20
Add: receipts	**1**	-
Deduct: payments	**-**	(13)
Balance 30 June	**8**	7

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

21 Financial instruments

(a) Categories of financial instruments

Financial Instruments	Notes	Consolidated			
		Carrying Amount 2012 $'000	**Fair Value 2012 $'000**	Carrying Amount 2011 $'000	Fair Value 2011 $'000
Financial assets					
Loans and receivables					
Cash at bank	7A	**3,411**	**3,411**	3,278	3,278
Investment held to maturity	7C	**67,389**	**67,389**	115,268	115,268
Investment	7C	**-**	**-**	-	-
Receivables for goods and services	7B	**14,251**	**14,251**	9,125	9,125
Loans	7B	**-**	**-**	-	-
Interest accrued	7B	**292**	**292**	628	628
Other	7B	**848**	**848**	768	768
Total financial assets (recognised)		**86,191**	**86,191**	129,067	129,067
Total financial liabilities					
At amortised cost					
Trade creditors	9E	**14,786**	**14,786**	11,383	11,383
Employees	9F	**5,544**	**5,544**	3,836	3,836
Grant received in advance	9G	**481**	**481**	687	687
Interest bearing liabilities	9A	**52**	**52**	2,484	2,484
Other	9H	**1,480**	**1,480**	1,433	1,433
Total financial liabilities (recognised)		**22,343**	**22,343**	19,823	19,823

(b) Net income from financial assets

Financial Instruments	Notes	Consolidated	
		2012 $'000	2011 $'000
Financial assets			
Loans and receivables			
Cash at bank	7A	**124**	124
Investment held to maturity	7C	**4,916**	7,233
Loans	7B	**-**	-
Net Income from financial assets		**5,040**	7,357

(c) Net expenses from financial liabilities

Financial liabilities			
At amortised cost			
Interest bearing liabilities	9A	**192**	105
Net expenses from financial liabilities		**192**	105

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 2012

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	
2012		**Carrying Amount**	**On Demand**
		$'000	**$'000**
Financial liabilities			
Trade creditors	9E	**14,786**	**-**
Employees	9F	**5,544**	**-**
Grant received in advance	9G	**481**	**-**
Interest bearing liabilities	9A	**52**	**-**
Other	9H	**1,480**	**-**
Total financial liabilities (recognised)		**22,343**	**-**
		Consolidated	
2011		Carrying Amount	On Demand
		$'000	$'000
Financial liabilities			
Trade creditors	9E	11,383	-
Employees	9F	3,836	-
Grant received in advance	9G	687	-
Interest bearing liabilities	9A	2,484	-
Other	9H	1,433	-
Total financial liabilities (recognised)		19,823	-

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**				
2012		**Consolidated**			
		1 Year or Less	**1 to 2 Years**	**More than 2 years**	**Total Contractual Cash Flows**
		$'000	**$'000**	**$'000**	**$'000**
Financial liabilities					
Trade creditors	9E	**14,786**	**-**	**-**	**14,786**
Employees	9F	**5,544**	**-**	**-**	**5,544**
Grant received in advance	9G	**481**	**-**	**-**	**481**
Interest bearing liabilities	9A	**52**	**-**	**-**	**52**
Other	9H	**1,480**	**-**	**-**	**1,480**
Total financial liabilities (recognised)		**22,343**	**-**	**-**	**22,343**
2011		Consolidated			
		1 Year or Less	1 to 2 Years	More than 2 years	Total Contractual Cash Flows
		$'000	$'000	$'000	$'000
Financial liabilities					
Trade creditors	9E	11,383	-	-	11,383
Employees	9F	3,836	-	-	3,836
Grant received in advance	9G	687	-	-	687
Interest bearing liabilities	9A	2,484	-	-	2,484
Other	9H	1,433	-	-	1,433
Total financial liabilities (recognised)		19,823	-	-	19,823

Notes to and forming part of the Financial Statements for the year ended 30 June 2012

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	
	2012	2011	**1.40%**	**-1.40%**	1.40%	-1.40%
			Profit or loss	**Equity**	Profit or loss	Equity
$'000			**2012 $'000**	**2012 $'000**	2011 $'000	2011 $'000
Investment held to maturity	**67,389**	71,888				
Interest	**1.40%**	1.75%	**943**	**943**	2,017	2,017
Interest	**-1.40%**	-1.75%	**(943)**	**(943)**	(2,017)	(2,017)

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 140 basis points (2011: 175 basis points) shock level was selected as a 'reasonably possible' change in market interest rate.

140 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	
	2012	2011	**15.00%**	**-15.00%**	15.00%	-15.00%
			Profit or loss	**Equity**	Profit or loss	Equity
$'000			**2012 $'000**	**2012 $'000**	2011 $'000	2011 $'000
USD Currency	**139**	139				
Foreign currency	**15.00%**	15.00%	**21**	**21**	21	21
Foreign currency	**-15.00%**	-15.00%	**(21)**	**(21)**	(21)	(21)

The method used to arrive at the possible risk of 15% (2011, 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% (2011, 15%) is managements best estimate of future USD foreign exchange volatility.

(g) Reconciliation of level 3 fair value hierarchy

	Investments	
	2012	2011
	$'000	$'000
Opening balance	-	5,000
Total gains or losses for the period recognised in profit and loss	-	(5,000)
Closing Balance	-	-

The investment in Australian Synchrotron Holding Company (ASHCo) of $5 million was assessed as requiring impairment testing. On the basis, ANSTO secured confirmation from the CEO of ASHCo that it only had secured funding to 30 June 2012 with a letter of comfort from the Victorian Government to 30 September 2012. On that basis ANSTO has determined that the investment of $5,000 thousand is fully impaired.

	Consolidated	
	2012	2011
	$'000	$'000
22 Operating lease arrangements		
Payment recognised as expense		
Minimum lease payments	193	203
	193	203
Operating lease commitments		
One year or less	**137**	137
From one to five years	**685**	685
Over five years	**903**	1,040
	1,725	1,862

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 (2011: $137,000).The annual rental is subject to review every three years.

23 Income tax expense (benefit)		
Income tax benefit	**(1,200)**	-
Reversal of Deferred Tax Asset	-	345
Total income tax expense (benefit)	**(1,200)**	345

ANSTO's subsidiaries are subject to normal taxation but are in tax loss positions.

Unbooked deferred tax assets in relation to unrecouped tax losses including timing difference in the subsidiaries is $52 thousand (2011: $1,047 thousand). The total deferred tax assets recognised in relation to PETNET Australia Pty Ltd for 30 June 2012 is $1,200 thousand

24 Other comprehensive income		
Changes in asset revaluation reserves	**129,148**	10,652
Total revaluation adjustments in other comprehensive income	**129,148**	10,652

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	
	2012	2011
	$	$
Current assets	**99,199**	141,891
Total assets	**1,155,946**	1,078,019
Current liabilities	**25,700**	21,318
Total liabilities	**316,531**	339,854
Contributed equity	**489,356**	481,956
Retained surplus	**(129,937)**	(94,387)
Asset revaluation reserve	**467,981**	339,109
Other reserve	**12,015**	11,487
Total equity	**839,415**	738,165
Profit or loss of the parent entity	**(35,043)**	(42,156)
Total comprehensive income of the parent entity	**93,829**	(31,504)

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.

The parent has no contingent liability for 2012 (2011: nil).

GOVERNANCE AND PERFORMANCE

Compliance

ANSTO is subject to the provisions of various Commonwealth Acts and Regulations made under these various Acts and Commonwealth Awards.

The principal Act is the *Australian Nuclear Science and Technology Organisation Act 1987*.

The principal Award is the Australian Nuclear Science and Technology Organisation (General) Award 1990.

Amendments to governance parts of the ANSTO Act

There were no changes to the governance part of the ANSTO Act during the 2011-12 reporting period.

Nuclear liability

The minister executed a new Deed of Indemnity on 27 August 2008 for a period of ten-years. The indemnity commits the Government to meeting any damages awarded against ANSTO, its employees and its contractors for damage caused by ionising radiation whilst providing comfort to the local community and to ANSTO's suppliers, who cannot be covered by ANSTO's normal insurance arrangements and are not accustomed to being exposed to risks of this nature. Any claim would first attach to the general $50 million cover that ANSTO has with Comcover to the extent that it was insured under that policy, with the remainder covered by this indemnity agreement.

The functions of the Board

A Board established under Section 8 of the *Australian Nuclear Science and Technology Organisation Act 1987* (ANSTO Act) governs ANSTO. The general functions of the Board, as set out in Section 10 of 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.

In particular, it has responsibility for:

- approval of organisational strategy and the annual business plan and budget
- monitoring financial performance
- monitoring managerial performance
- ensuring that the significant risks facing the organisation have been identified, and that appropriate control, monitoring and reporting mechanisms are in place.

The *Commonwealth Authorities and Companies Act 1997* (CAC Act) requires the Board to comply with certain accountability and corporate governance principles, including:

- the maintenance of an Audit Committee
- specific financial and reporting provisions
- disclosure of all Board members' personal interests
- provision of indemnities and indemnity insurance in certain circumstances.

All CAC Act requirements are currently being met.

Processes are in place for performance assessment of both the Board as a whole and of the individual members of the Board.

The Board has established a Risk & Audit Committee and a Remuneration Committee. All matters considered by those Committees are submitted to the Board for information and, where appropriate, for ratification.

Board Charter

ANSTO has an established Board Charter, setting out the respective rights and responsibilities, functions and powers of Board members and ANSTO executives. It is made available internally on ANSTO's intranet and on ANSTO's website in line with current best practice.

Board membership

During the 2011-12 financial year, the Board comprised eight non-executive members, drawn from the broader community, who are not involved in the day-to-day running of the organisation, and the Chief Executive Officer.

The ANSTO Act provides that the Chief Executive Officer shall manage the affairs of the organisation, 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. Its members during the 2011-12 financial year had experience in areas that included industry, information and communication technology, mining, scientific research, medicine and the commercialisation of research.

Meetings – Board

Member	Eligible to attend	Attended
Dr Paul Greenfield AO (Chair)	6	6
Professor David Copolov, OAM	5	5
Professor John Hearn	5	3
Ms Christine McLoughlin	6	5
Dr Susan Pond, AM	6	5
Professor Judy A Raper	0	0
Mr John Ryan, PSM	6	6
Ms Erica Smyth	6	6
Professor Andrew M Scott	6	6
Dr Adrian Paterson (Chief Executive Officer)	6	6

The Board meets regularly in accordance with a formally approved timetable and agenda.

Six Board meetings were held during the 2011-12 financial year. Details of the number of Board meetings attended by each member during the period in which each member held office during the financial year are shown above.

Board remuneration and allowances

The remuneration and allowances of members of the Board, including the Chief Executive Officer, are determined by the Remuneration Tribunal. Remuneration of members of the Board is disclosed in the Financial Statements.

Disclosure of interests of Board Members

Sections 27F-27K of the CAC Act provide for the disclosure of 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. All these requirements were met during the year.

Board member access to independent professional advice

The Board has established procedures by which members, in the interests of their duties, may seek independent professional advice at ANSTO's expense. In brief, members must first seek permission from the ANSTO Board Chairman.

Report of operations

Section 9 and Schedule 1 of the CAC Act requires that the Organisation's Annual Report include a report of operations, financial statements and the Auditor General's report on those financial statements. The Commonwealth Authorities (Annual Reporting) Orders 2011 set out the requirements for such a report.

The Board reports that:

- ANSTO's mission and strategic directions are being actioned
- Actual performance is reported against approved performance indicators
- There have been no significant changes in ANSTO's state of affairs or principal activities during the year
- ANSTO has continued to manage both the risks and opportunities it faces.

The Board also reports that, in the opinion of senior management and the Board, at the time of making this report, adequate cash resources are, and will continue to be, available to cover ANSTO's requirement for working capital, to pay existing debts, and meet obligations during the next financial year.

The Board states that a risk oversight and management policy and supporting processes are in place to guide risk management activities in the organisation.

Health, safety and environmental protection

The Board places primary importance on the safe performance of all ANSTO activities. The monitoring of health, safety and environmental protection in general and compliance with relevant legislation in particular, is designated as a responsibility of the whole Board. During 2011-12, ANSTO continued to focus on improving the organisational safety culture and on initiatives relating to key elements underpinning a good safety culture. Improvements were made to the event reporting system which has seen a significant improvement in the data, particularly from the 'near-hit' events. This, coupled with a CEO-directed focus on appropriate and timely investigation of all reported events, has driven continuous improvement in safety performance as evidenced in a significant reduction in worker injuries. Contractor safety management has also remained a key area of focus for the organisation, with the aim of integrating ANSTO's contract partners into its safety culture and encouraging contractors to support ANSTO as a learning organisation by sharing elements of best safety practice. This approach has been translated into a legal obligation under the Work Health and Safety Act, which was enacted on 1 January and represents a significant change by harmonising WHS legislation across the majority of federal, state and territory jurisdictions.

ANSTO prepared for the new legislation and focussed on engaging across the organisation to disseminate information relating to the changes and ensuring that its processes are compliant with the changes in legislation.

With the support of the CEO and Executive leadership team, ANSTO has developed a safety strategy that complements the strategic aims in the 2010-2015 Corporate Plan. The safety strategy was developed with input from across the organisation, including Health and Safety Representatives and trade union delegates. The strategy will identify key actions and programs to deliver the strategic aims over the coming financial years.

Risk & Audit Committee

The Risk & Audit Committee, a formal sub-committee of the Board, comprised during the year of Ms C McLoughlin (Chair), Professor AM Scott, Professor D Copolov OAM, Professor J Hearn, Ms E Smyth, Dr S Pond AM, Mr J Ryan PSM and a member external to ANSTO, Mr W Wilton. Mr Wilton is a Chartered Accountant. The Chair of the ANSTO Board, the Chief Executive Officer, the Chief Financial Officer, representatives of the Australian National Audit Office, Deloitte representatives (who are under contract by the Australian National Audit Office) and the Senior Manager, Governance, Risk & Audit attended all meetings or relevant parts of all meetings by invitation. Others attend meetings, as appropriate, at the invitation of the committee.

Meetings – Risk & Audit Committee

Member	Eligible to attend	Attended
Ms Christine McLoughlin	5	4
Professor David Copolov OAM	4	4
Professor John Hearn	4	3
Dr Susan Pond AM	5	4
Mr John Ryan PSM	5	5
Professor Judy A Raper	0	0
Professor Andrew M Scott	5	5
Ms Erica Smyth	5	5
Mr Warren Wilton (External Representative)	4	3

In accordance with good practice, all Board members receive copies of the Risk & Audit Committee papers and meeting minutes, and can attend committee meetings as a right. The committee has been established by the Board under a formal written charter to oversee the organisation's risk management policies, practices and controls in relation to financial and commercial activities, including the financial reporting process, legislative and regulatory conformance, corporate governance and asset protection. Its charter extends to the review of safety and environmental systems and performance. Additionally, in accordance with the provisions of the CAC Act, the committee is responsible for assisting Board members to fulfil their specific responsibilities under that Act. The committee has unlimited access to both the internal and external auditors and to senior management.

The committee scrutinises the annual financial statements of ANSTO and considers the appropriateness of accounting practices reflected therein. It receives a signed recommendation from the Chief Executive Officer, and the Chief Financial Officer, as to the veracity of the financial statements signed by the Board.

Five Risk & Audit Committee meetings were held during the financial year. Details of the number of committee meetings held and attended during the period in which each member held office during the financial year are provided in the table above.

The committee generally meets quarterly.

The remuneration and allowances of Board members who are members of the Risk & Audit Committee are determined by the Remuneration Tribunal. The remuneration of the External Representative is determined by the Board on appointment.

Meetings – Remuneration Committee

Member	Eligible to attend	Attended
Dr Paul Greenfield AO (Chair)	2	2
Mr John Ryan PSM (Member)	2	2

Remuneration Committee

The Remuneration Committee, a formal subcommittee of the Board, comprised during the year Dr Paul Greenfield AO (Chair) and Mr John Ryan. The Chief Executive Officer attends all meetings or relevant parts of all meetings by invitation. Others attend meetings, as appropriate, at the invitation of the committee.

This committee was established by the Board under a formal written charter to oversee:

- The overall remuneration policy and strategy for the organisation
- The performance and remuneration policies for the Chief Executive Officer
- The compliance of remuneration policies and practices with statutory and regulatory requirements.

Induction and continuing professional development of ANSTO Directors and Executives

Processes are in place for induction and ongoing education to inform directors and executives of their responsibilities and rights. New directors and executives have access to appropriate induction documents and processes (including those relating to safety and security) and to ANSTO officers. Under the Statement of Intent, the ANSTO Board committed to the principles of good corporate governance and the efficient and effective execution of its duties, including an evaluation and review of its performance.

In July 2011 the ANSTO Board undertook an evaluation and review of its performance which indicated that the Board is operating efficiently and effectively.

Risk management

The Board is responsible for the governance of risk through formal processes, which include the development and implementation of a policy and plan for a systematic and disciplined approach to evaluate and improve the effectiveness of risk management, as well as the related internal control, compliance and governance 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 strategies require careful consideration and 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 ANSTO's stakeholders.

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

During the financial year the Board initiated and participated in a full day strategic risk workshop.

Ethical standards

ANSTO's ethics policy is set out in a document entitled Code of Ethics. The Code provides a reference point for ethical behaviour and applies to members of the Board, management and all staff. The code sets out the standards for ethical behaviour and conduct and provides guidance by defining the expected values and standards of workplace behaviour and performance.

Fraud control

ANSTO has an established fraud control policy, plan and related strategies, in line with the Commonwealth Fraud Control guidelines and as required by the Commonwealth Protective Security Policy Framework.

External audit

Under Section 8 of the CAC Act the Commonwealth Auditor-General, through the Australian National Audit Office (ANAO), is the external auditor for ANSTO.

The ANAO, as a matter of policy, provides only audit services to ANSTO.

The Risk & Audit Committee reviews the ANAO audit plan and reports and meets with ANAO representatives prior to recommending to the Board that the annual financial statements be accepted and the Statement by Directors signed.

Internal audit

The ANSTO Internal Audit function has a dual reporting line to the Risk & Audit Committee and the Chief Executive Officer. Its responsibility is to provide an independent, risk-based advisory and assurance function, as set out in a formal charter periodically reviewed by the Risk & Audit Committee and endorsed by the Board. The Risk & Audit Committee approves the annual Internal Audit plan and receives regular reports on progress against that plan.

Internal control

The Board is responsible for ensuring that appropriate policies and internal controls are in place and operating.

Compliance and review are monitored through the Risk & Audit Committee and the Internal Audit function.

Service Charter

ANSTO's Service Charter sets out a statement of what ANSTO does and the standards of product and service that customers, stakeholders and the community can expect from the organisation.

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 that issued in relation to the 2011-12 financial statements.

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

Ministerial directions

There were no ministerial directions to ANSTO made under either the ANSTO Act or the CAC Act during the reporting year.

Statement of Expectations

The Board approved and signed the Statement of Intent for ANSTO which acknowledges and responds to the Statement of Expectations from the responsible minister for Innovation, Industry, Science and Research. This statement recognises and ensures that ANSTO will play an active role in implementing Australia's innovation agenda outlined in Powering Ideas: *An Innovation Agenda for the 21st Century.* Further, it recognises ANSTO's commitment to undertake research and deliver outcomes relevant to the National Research Priorities, including supporting an environmentally sustainable Australia; promoting and maintaining good health; developing frontier technologies for building and transforming Australian industries; and safeguarding Australia.

Indemnities and insurance premiums for officers

ANSTO's insurance coverage 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 all fully owned 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.

Business continuity planning

Continuity of ANSTO business is a critical issue 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 and social well-being of our society. A failure to deliver these could have significant consequences for those concerned. As a consequence, ANSTO regularly reviews all aspects of its business continuity management plans to ensure a constant state of readiness, including ANSTO's response to any incident that may eventuate at the OPAL research reactor. A test schedule is in place and is being monitored, additionally plans are scheduled to be reviewed and updated annually.

Regulatory Relationships

ANSTO operates under the regulatory control of several organisations in particular, ARPANSA, Comcare and TGA. The Board is responsible for ensuring that appropriate policies and internal controls are in place to comply with the regulations. The Board recognised ANSTO's regulatory compliance in relation to various matters throughout the year.

APPENDIX 1

Equality of Employment Opportunity

ANSTO's March 2012 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 the diversity of ANSTO's workforce, including Aboriginal Torres Strait Islander employees, employees with a disability and employees from culturally and linguistically diverse backgrounds.

The Enterprise Agreement also contains extended maternity leave entitlement.

Family services and Childcare Centre

ANSTO continued its Corporate Family Program which is a partnership between ANSTO and Expect A Star Education Services that provide a range of family services, including parenting seminars; a range of qualified, background checked, and First Aid-trained nannies, babysitters and emergency care workers; and the purchase of educational resources.

ANSTO also continued it partnership with Sutherland Shire Council for vacation care for ANSTO employees and contractors at their Lucas Heights venue during school holidays.

The building of ANSTO's Child Care facility has commenced with an expected completion date of July 2013.

Equality of employment opportunity for 2010-11			
	Number employed	% of total staff	Average salary
Female	329	28%	$ 73,204
Male	830	72%	$ 90,388
People with disabilities	8	1%	$ 65,782
Aboriginal & Torres Straight Islander	9	1%	$ 75,203
Non-english speaking background	266	23%	$ 92,403

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 is committed to operating in a manner that protects the environment and is consistent with Australian and international standards.

ANSTO's commitment to environmental protection and sustainability principles is defined in its OHSE Policy and Corporate and 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 under the EPBC Act. No such referrals were made during the period. Proposals for new (or modifications to existing) facilities or processes undergo a rigorous 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.

Environmental performance indicators

ANSTO is focussing on reducing its environmental footprint by minimising waste and the consumption of resources such as paper, electricity and water, and by recycling consumables. Whilst power and water consumption increased very slightly compared to the previous year, less waste was sent to landfill and recycling increased by 45% overall.

APPENDIX 3

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

Resource Usage	Units	2010-11	2011-12	% Difference
Electricity	GWh	37.12	37.95	2.2%
Water	m^3	280,086	283,090	1.1%
Waste Disposal				
Waste sent to landfill	tonnes	307.5	268.6	-14.5%
Liquid effluent discharged to sewer	m^3	111,055	118,421	6.2%
Recycled Waste				
Cardboard	tonnes	20.2	21.2	4.7%
Co-mingled containers	tonnes	4.17	7.0	40.7
Paper	tonnes	No data	12.54	

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. Environmental radiation and local weather conditions are reported online via the ANSTO webpage. Many of the monitoring results are independently verified.

Results of environmental monitoring in 2011-12 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.

ANSTO's environmental monitoring program was peer-reviewed by an international team of experts during the periodic safety review of the OPAL research reactor in 2011. The program was found to be fit-for-purpose and confirmed that the modern OPAL reactor has significantly reduced the contribution made by ANSTO's research reactor to the already tiny potential public dose from liquid and airborne emissions.

APPENDIX 3

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

Liquid effluent discharges within limits

Effluent discharged from ANSTO into the sewer complied with all limits for radioactive discharges in accordance with the Trade Waste Agreement with Sydney Water Corporation. A total of 118,421 m^3 of waste water (trade waste and sewage) was treated, tested and discharged. Compliance with these limits ensures that water at the Cronulla sewage treatment plant meets World Health Organisation drinking water standards for radioactivity. 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 sewage treatment plant and is ultimately discharged to the ocean at Potter Point.

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. Stack releases from all facilities were well within the annual operating compliance limits in 2011-12.

Modelled dose to the public

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.

The maximum public dose estimated for ANSTO's airborne emissions in 2011-12 was 0.0018 mSv. This is 0.2 per cent of the annual public dose limit of 1.0 mSv established by ARPANSA, and slightly lower than the previous year. Doses from ANSTO's airborne emissions in 2011-12 remain below the 0.02 mSv ALARA objective despite increased production of beneficial medical isotopes (see Figure 1).

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.

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

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 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, water quality and groundwater movement. Groundwater from the Lucas Heights site contained low levels of tritium and naturally-occurring radionuclides.

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

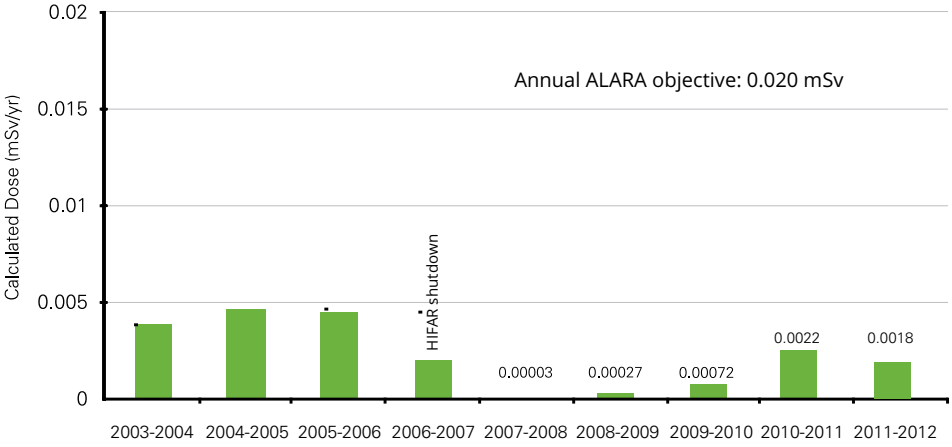
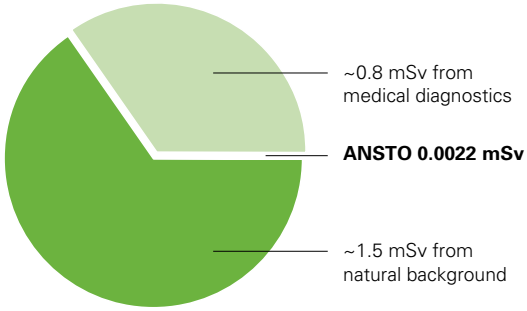


Figure 2: Annual dose to the general public from various sources compared to the maximum potential dose from ANSTO airborne emissions at 1.6 km in 2011-12.



APPENDIX 3

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

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. The local Lucas Heights weather data is also available on ANSTO's website.

ANSTO also reports annually 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 is integrating ESD principles into its management processes by including environmental risk assessments at the project planning phase. Major capital projects include environmental impact statements and environmental protection plans. We 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.

We are monitoring our carbon footprint and participating in the Sustainability Advantage Program run by the NSW Office of Environment and Heritage.

By utilising our assets and infrastructure more effectively, we have increased scientific productivity thereby enhancing the environmental sustainability of our operations.

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 ESD principles.

Finally, ANSTO's commitment to sound environmental management and ecologically sustainable development 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.

APPENDIX 4

Occupational Health and Safety Act 1991, section 74 / *Work Health and Safety Act 2011* (Cth) (from 1 January 2012)

Safety commitment

ANSTO is committed to ensuring a safe and healthy 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 Health, Safety and Environment Policy which is supported by a framework of documents that constitutes our 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.

2012 saw the introduction of harmonised Work, Health and Safety (WHS) legislation across the majority of federal and state and territory jurisdictions, hailed as the most significant change in the WHS legislative landscape in Australian history. As a result ANSTO has implemented a fundamental review and update of its safety management system to meet the requirements of the new 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 2011-12 there was a slight increase from 2.6 compared to 1.6 in 2010-11. Despite this increase, ANSTO's LTIFR remains well below the industry average.

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. 2011-12 saw a continued focus on increased event reporting, focussed investigation and completion of arising actions, with a 29% increase in OFIs and a consequential 14% reduction in injuries resulting in the

APPENDIX 4

Occupational Health and Safety Act 1991, section 74 / *Work Health and Safety Act 2011* (Cth) (from 1 January 2012)

loss of one or more shifts; with a total of six Lost-Shift Injuries being recorded for the full years operation. Although the trend in such injuries remains downward, ANSTO continues to focus on meeting our stated objective of Zero Harm to our workers.

ANSTO also works with its regulators to improve Work Health & Safety (WHS) across the site. In 2011-12 ANSTO informed Comcare of 23 notifiable incidents. ANSTO was issued one 'non-disturbance notice' in 2011-12 by Comcare for a dangerous incident when an active electrical service was inadvertently damaged during excavation works for a construction project. This notice was lifted by Comcare on the same day upon site inspection confirming the incident was being appropriately managed by ANSTO. No one was injured as a result of this incident.

Safety Initiatives

The following initiatives contributed to ANSTO's commitment to the health and safety of employees, contractors (who are now both regarded as workers under the WHS legislation), and visitors:

- Improved induction processes
- Worked with contract partners to ensure construction is carried out safely
- Introduction of the Managing @ ANSTO program, with an emphasis on the key role of health and safety responsibilities of managers in WHS
- A continued emphasis on ANSTO having a 'reporting culture' whereby incidents, near hits, hazards and safety observations are encouraged
- Initiation of a detailed asbestos survey of individual buildings and areas and the extension of the asbestos register to include additional legacy hazards.
- Roll out of a personally issued STAR card (Stop, Think, Act, Review) to all staff reminding them of ANSTO's shared safety values and behaviours
- Bimonthly safety focus that encouraged ANSTO workers to be vigilant regarding particular safety topics

Through the first half of 2012, ANSTO developed a safety strategy focussing on its people, places (of work) and processes. The strategy is designed to be complementary to the 2010-2015 Corporate Plan and was developed with senior management leadership and input from across the organisation, including trades union delegates and health and safety representatives.

Initiatives targeted at the health and welfare of employees included the Men's and Women's Health Programs, Bowel Screening and Flu Vaccination Program.

APPENDIX 4

Occupational Health and Safety Act 1991, section 74 / *Work Health and Safety Act 2011* (Cth) (from 1 January 2012)

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 2011-12 show that the radiation doses received by ANSTO workers remain significantly below regulatory limits. In 2011-12 the average effective dose across all ANSTO workers was 0.5mSv.

Table 1: Effective dose

	2007-08	2008-09	2009-10	2010-11	2011-12
Maximum Effective Dose (mSv)	8.9	8.6	7.0	6.2	6.4
Average Effective Dose (mSv)	0.6	0.6	0.4	0.4	0.5
Collective Effective Dose (mSv)	531	542	399	425	431

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.

APPENDIX 4

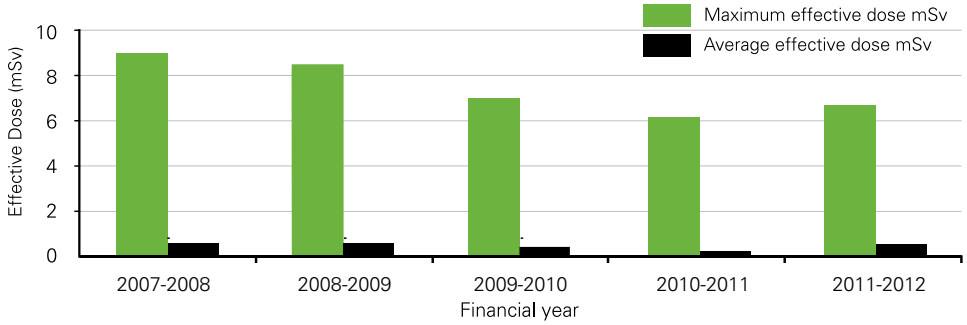
Occupational Health and Safety Act 1991, section 74 / *Work Health and Safety Act 2011* (Cth) (from 1 January 2012)

Table 2: Distribution of individual effective dose

mSv	2007-08	2008-09	2009-10	2010-11	2011-12
0 to <2	914	907	890	989	934
2 to <5	36	37	28	23	20
5 to <10	13	12	8	7	3
10 to <15	0	0	0	0	0
>15	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.

Figure 1: Comparison of Maximum and Average Effective Doses.



Regulations give annual dose limits for radiation workers for the whole body (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 exceptions to protect essential public interests, including the privacy of individuals and the business affairs of those who give information to the agency.

From May 2011, ANSTO has been implementing initiatives in compliance with the Information Publication Scheme (IPS) requirements of the FOI Act. 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 http://www.ansto.gov.au/ips. 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 95 - 98 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 http://www.ansto.gov.au/ips.

4. **Details of officer appointments at ANSTO**

   Details of officer appointments can be found at page 3 - 4 of this report and a link to this information can be found on ANSTO's website at http://www.ansto.gov.au/ips.

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 http://www.ansto.gov.au/ips.

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 http://www.ansto.gov.au/ips.

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 2011-12 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 http://www.ansto.gov.au/ips.

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 http://www.ansto.gov.au/ips.

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 to: 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 Annual Report requirements

Index of compliance with reporting guidelines under various Acts, Regulations and Orders applicable to ANSTO as a Commonwealth authority

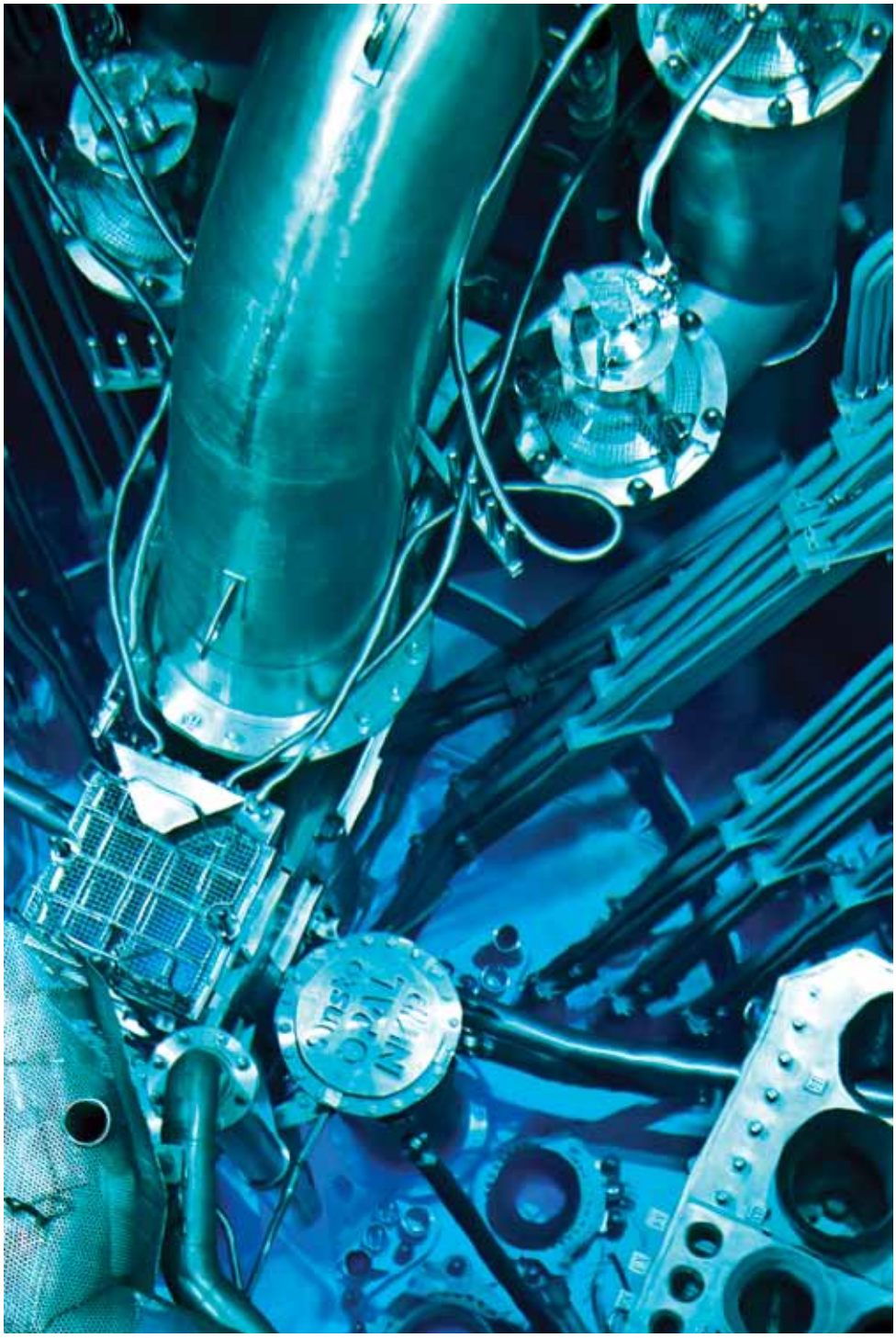
ANSTO Act 1987

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*

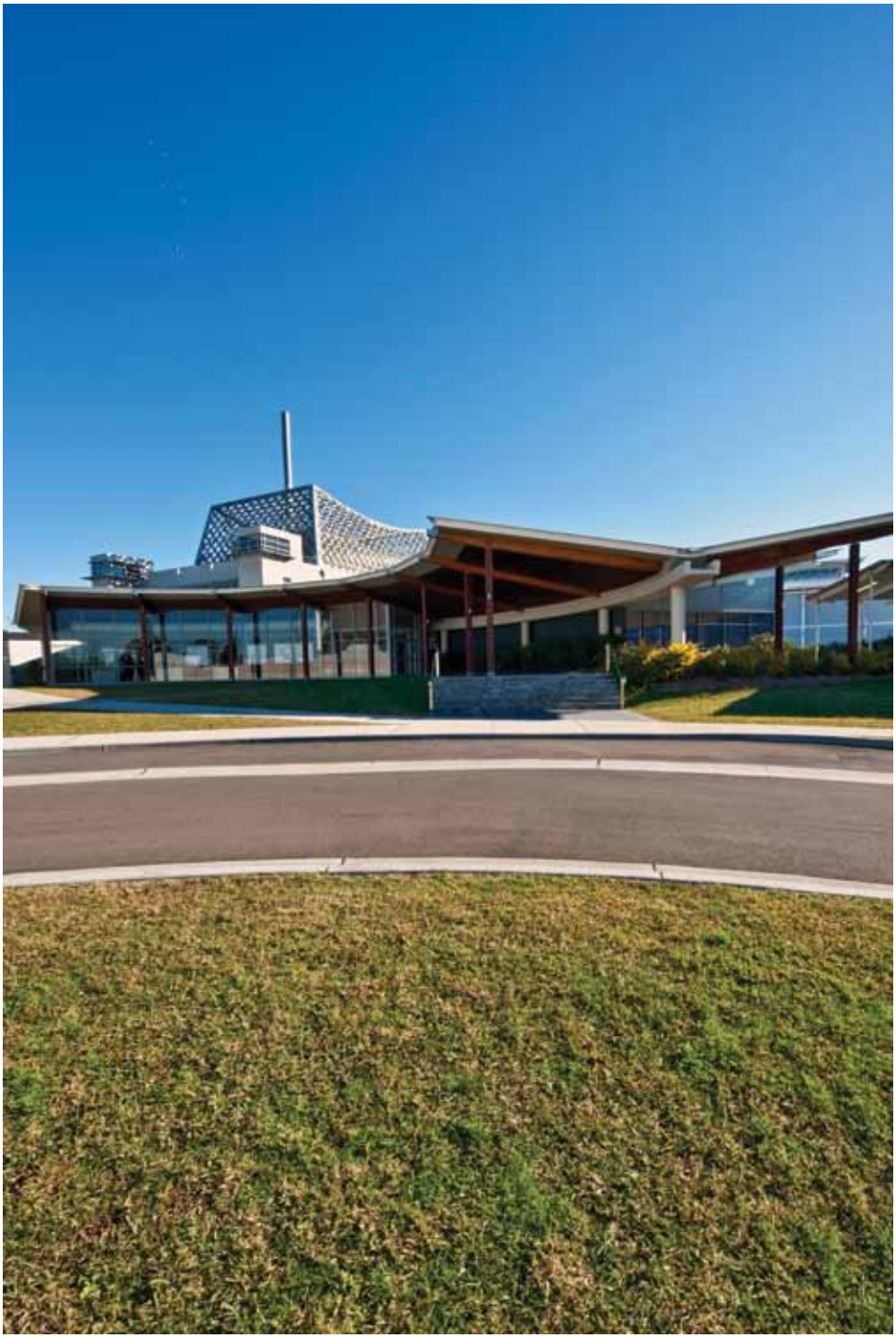
Commonwealth Authorities (Annual Reporting) Orders 2011 under the *Commonwealth Authorities and Companies Act 1997*

ACRONYMS

IME	Institute of Materials Engineering
IMSS	Institute of Materials Structure Science
J-PARC	Japan Proton Accelerator Research Complex
KAERI	Korean Atomic Energy Research Institute
KEK	High Energy Accelerator Research Organisation
LEU	Low enriched uranium
LLWP	Local Liaison Working Party
LHC	Large Hadron Collider
LHSTC	Lucas Heights Science and Technology Centre
MOU	Memorandum of understanding
MOX	Mixed oxide
NEA	Nuclear Energy Agency
NMC	National Medical Cyclotron
NYSF	National Youth Science Forum
OAM	Order of Australia Medal
OECD	Organisation for Economic Co-operation and Development
OPAL	Open Pool Australian Lightwater reactor
PET	Positron emission tomography
SANS	Small-angle neutron scattering
SAXS	Small-angle X-ray scattering
SERA	Safety, Environmental and Radiological Assurance
SINAP	Shanghai Institute of Applied Physics
STAR	Small Tandem for Applied Research
USA	United States of America
WTIA	Welding Technology Institute of Australia



The open pool design of ANSTO's OPAL research reactor makes it easy to see and manipulate items inside the reactor pool (p.29).



The OPAL research reactor building (p.29).

INDEX

A

INDEX

INDEX

M

N

O

P

Q

INDEX

V

W

CONTACT DETAILS

ANSTO

New Illawarra Road, Lucas Heights
New South Wales 2234 Australia

Postal Address
Locked Bag 2001
Kirrawee DC NSW 2232

Telephone
+61 2 9717 3111

Facsimile
+61 2 9717 9210

Email
enquiries@ansto.gov.au

Website
www.ansto.gov.au

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

Canberra

ANSTO representative
Level 7, 15 London Circuit
GPO Box 1620
Canberra ACT 2601
T + 61 2 62758300

Vienna

Counsellor (Nuclear)
Australian Embassy
Mattiellistrasse 2-4
A-1040 Vienna
Austria
T + 43 1 5067 4119

Street Address:
New Illawarra Road, Lucas Heights NSW 2234

Postal Address:
Locked Bag 2001, Kirrawee DC NSW 2232

Telephone
+61 2 9717 3111

Email
enquiries@ansto.gov.au

Fax
+61 2 9543 5097

Website
www.ansto.gov.au