The objective of the staff induction presentation from Executive is to not only educate new staff on the functions of ANSTO but importantly to inspire and engender staff pride in our organisation.
Key point - We produce around 85 per cent of all of Australia's nuclear medicine

• ANSTO delivers 10,000 patient doses of vital radiopharmaceutical every week to the Australian health industry, used by medical professionals in the diagnosis and treatment of serious diseases such as cancer

• Our researchers undertake ground breaking medical research in areas such as cancer, Alzheimer’s and Parkinson’s. For example, ANSTO’s LifeSciences team have been involved in the developed of a promising new radiopharmaceutical, known as MELO50, to characterise melanoma skin tumours. With the world’s highest rate of melanoma this discovery has the potential to help hundreds of Australians every year

• Our scientists are undertaking research on the skin secretions of Australian frogs using ANSTO’s time-of-flight neutron reflectometer, Platypus, that could lead to the development of powerful new forms of antibiotics. These could help fight hospital acquired infections that do not respond to some antibiotics.

Photos clockwise from top left: a human skin cancer; a vial of nuclear medicine produced by ANSTO Health; older couple; Doctor viewing a SPECT/CT (single-photon emission computed tomography/computed tomography) bone scan; Australian Green-Eyed Tree Frog; family leaving a hospital
Key point - We study everything from climate change to wetlands ecology

• ANSTO undertakes environmental research into important issues affecting our planet including climate change, water resource management and pollution detection studies

• Our research is being used to better understand the ecology of wetlands in the Murray-Darling basin in both wet and dry seasons to provide input into their management

• We has uncovered clean fresh water in the outback at Cooper Creek in southwest Queensland. This fresh water provides a potential insight into how ecosystems along our dry-land rivers are sustained

• The East Antarctic Ice Sheet holds enough water to raise the global sea level by around 60 metres and inundate coastal towns and cities around the world – so understanding its past behaviour in climates that have warmed is crucial. A new dating technique, known as in-situ cosmogenic radionuclide surface exposure, developed by our scientists is providing climate modellers with important information that will help predict how the Antarctic ice will respond to a changing climate.

Photos clockwise from top left: Strong winds; cracked earth; rain forest; pollution; ANSTO’s Deboish Mazumder and Jordan Illes of the Office of the Environment and Heritage NSW, Department of Premier and Cabinet collecting water samples in the Murray-Darling; Antarctic ice
Key point - We have partnered with the mining industry for 30 years

• ANSTO’s expertise is employed by many different industry groups

• For over 30 years, ANSTO Minerals has been a lead consultancy for the uranium and rare earths mining sector.

• Through our irradiation facility GATRI (Gamma Technology Research Irradiator), we provide a comprehensive range of irradiation services to sterilize items for medical, health, industry, agriculture and research purposes

• Our Business and Commercialisation team provides a conduit for industry to work with our scientists to develop new products

• Our Synroc (synthetic rock) technology, developed by ANSTO, uses naturally occurring minerals that safety lock up radioactive waste

• An ANSTO invention, Rapid Visco Analyser or nRVA, could revolutionise food manufacturing processes by allowing manufacturers to make food more efficiently, with lower energy input and offer health benefits like helping counter bowel cancer

• Most Australians own at least one Li-ion battery, usually in a device such as a mobile phone. Research by our scientists, using neutron diffraction, is helping to improve the performance of these batteries

• A new software program developed by our researchers is being quickly snapped up by coal-fired power stations across the country to help improve their efficiency. The software, ‘RemLife’, gauges the wear and tear of plant infrastructure and calculates the damage a power plant sustains during its operating cycle which allows prediction of how much longer plants can operate safely

Photos clockwise from top left: Drilling rig; handshake; open cut mine; operator loading a silicon ingot into the double transfer unit located on the side of the OPAL service pool; ANSTO Health staff member testing a nuclear medicine finished good; Hot-isostatic Pressing (HIP) technology sliced bread
Key point - We are Australia’s foremost carbon dating facility. Carbon dating uses the naturally occurring radioisotope carbon-14 to determine the age of organic materials.

- Our studies on *Ulmus glabra* (Wych’s elm) leaves found within the pages of a 450-year-old Anglican ‘Great Bible’ owned by the University of Western Australia, have determined the radiocarbon date of the leaves to be around AD1560. Neutron activation analysis (NAA) on the leaves also identified the presence of a range of different elements.

- ANSTO meteorite research is setting us up to become an internationally recognised centre for meteorite studies. The research is looking at very small particles found within a meteorite called chondrules, which are about 1mm in diameter, and even smaller nanodiamonds which, at around 2-3 nanometres in diameter. The research is helping unlock the elemental make up and origins of our solar system.

- Nuclear techniques are also increasingly being used to tell us who we are and where we have come from. Research by our scientists is applying isotopic methods and atom mass-spectrometry with radiocarbon dating to archaeological remains from Bronze Age sites in northern China in order to better understand cereal cultivation, animal husbandry and bronze metal-work technology.

*Photos clockwise from top left: Professor John Dodson with members of the Chinese Academy of science undertaking field work in China; three artefacts found in Huoshiliang China; UWA’s Anglican ‘Great Bible’ and it’s mysterious leaves; close up of two of the *Ulmus glabra* (Wych’s elm) leaves; planet Earth; meteorite entering the Earth’s atmosphere.*
Key point - State-of-the-art technology – including Australia’s only nuclear reactor

• We are home to some of Australia’s most significant scientific facilities and equipment

• OPAL – the Open Pool Australian Light-water reactor – is Australia’s only nuclear research reactor used to produce radiopharmaceuticals for the diagnosis and treatment of cancer and other serious diseases, undertake world-class scientific research in areas as diverse as health and climate change; and provides irradiation services such as the irradiation of silicon used in the manufacture of electronic goods such as digital cameras, computers and mp3 players

• Accelerators – ANSTO is also home to Australia’s ANTARES (the Australian National Tandem Accelerator for Applied Research) accelerator, the STAR (Small Tandum for Applied Reach) accelerator and soon to be completed $25 million Centre for Accelerator Science. Accelerators used to analyse extremely small samples to determine their elemental composition and age

• Neutron beam instruments – our OPAL research reactor is adjacent to research facilities containing a number of neutron beam instruments used for solving complex research and industrial problems. Neutron scattering allows scientists to see what X-rays cannot. They look at materials from the inside out, helping scientists to understand their atomic structure and how materials respond to various stimuli.

Photos clockwise from top left: ANSTO’s triple-axis spectrometer, Taipan; ANSTO’s time-of-flight reflectometer, Platypus; Operators using control rods in the OPAL reactor; ANTARES; AMSTO’s Engineering and Capital Projects support workshop
Key point - ANSTO has some of Australia’s best minds, including around 300 PHDs working across a range of scientific fields

• We employ over 1000 staff – at our Southern Sydney site. Staff are employed in technical and engineering services; research and innovation; and enabling and support roles. There are over 400 people employed in technical and trades roles.

• Our organisation is made up of a diverse range of people with a variety of skills, all essential to helping us reach our strategic goals.

*Photos, left to right: Construction worker; instrument operators; scientists working on a micro PET/CT camera*
Additional units under enablers (these reveal at the end):

- **HR** – includes Industrial Relations, HR Business Partners, and Payroll

- **Office of the CEO** – includes Government, International and External Relations, Support Services, Strategic Research, Strategy Coordination, Internal Audit, and Legal Counsel

- **Nuclear Operations** – includes Reactor Operations and Waste Operations
Key point - Our 1st priority: the safety of our employees, community and environment

This chart outlines the core values that must be woven into all our activities:

1. **Safety, security and environmental sustainability** – safeguarding human health, ensuring high priority to safe and secure operations, and minimise our environmental footprint.

2. **One ANSTO** – a unique organisation, working as one to harness the power of nuclear science and technology to solve the great scientific, environmental and human challenges of our times.

3. **Transformation and Performance** – increased flexibility, agility and efficiency through de-bureaucratisation, increased accountability and performance through a focus on outcomes.

4. **Partnerships and Collaboration** – working collaboratively with our partners, both internal and external, for the benefit of government, customers and community. *We encourage employees to work together to form internal partnerships to help us reach our strategic goals.*
One of ANSTO’s core functions is to act as a trusted advisor to Government. Such advice is provided to a range of government departments and agencies, first and foremost our own department the **Department of Innovation, Industry, Science, Research and Tertiary Education (DIISRTE)**. ANSTO provides scientific data to DIISTRE in order to assist them in developing scientific policy. The department also assists us in securing funding and administering major grants programs (eg. Centre for Accelerator Science (CAS)).

Some of the key agencies with which we liaise directly on policy issues are the:

- **Department of Resources, Energy and Tourism (DRET)** – on issues such as radioactive waste management policy and practice
- **Department of Foreign Affairs and Trade (DFAT), including the Australian Safeguards and Non-proliferation Office (ASNO)** – on matters of national security, international collaboration and discussions on the peaceful uses of nuclear technology
- **Department of Defence** - as a research agency working with Defence agencies on new materials for defence applications, and as a source of advice to Defence and intelligence agencies in relation to matters of proliferation concern
- **Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)** - as regulator (ARPANSA) to operator (ANSTO), and in advancing Australia’s national interests in nuclear and radiation safety.

We also work directly with state governments on particular issues.
Key point – We are here to make a contribution whether it’s in health outcomes, disease cures, helping the mining industry, keeping Australia safe through promoting the peaceful uses of nuclear and helping to understand climate change, just to name a few

• Delivering world-class research and innovation in nuclear science and technology – ANSTO’s strength lies in research in interactions and phenomena at the molecular atomic and sub-atomic scales and relating this to complex physical and biological systems. ANSTO research focuses on four key research areas; materials engineering, environmental research, life sciences and neutron scattering

• Expanding ANSTO’s reach and contribution, exploiting landmark technologies – we are working towards establishing a truly national presence, expanding our leadership role in the Australian nuclear science and technology community, re-engaging in a number of areas that are of global scientific significance and, strengthening local and global networks and specific communities.

• Serve the nuclear needs of the government, industry, community and people of Australia – We provide radiopharmaceuticals for medical diagnosis and therapy as well as expanding nuclear knowledge and capability in areas such as nuclear safety, security and safeguards, radioactive waste management and nuclear forensics. ANSTO also plays a vital role in providing expert and independent advice to the Government, proactively supporting the safe use of nuclear science and technology in our region and internationally.

• Drive organisational renewal – We are sharpening our focus on long-term financial sustainability. This includes the judicious use of government appropriations and the maintenance of appropriate internal controls and governance structures. We are seeking to increasingly leverage our research and development activities and grow revenue.
Key point - ANSTO is growing. New technology will help increase our contribution

- We currently have seven neutron beam instruments in operation. We will have 13 by the end of 2013 and 30 in the long term, making Australia the clear leader in neutron beam science in the southern hemisphere. Neutron scattering allows scientists to see what X-rays cannot. They look at materials from the inside out, understanding their atomic structure and how materials respond to various stimuli, such as high magnetic fields and extreme temperatures.

- The Environmental Radioactivity Measurement Centre project will provide new laboratories and some new office space to replace the existing laboratories of the Environmental Monitoring and Radioactivity Laboratories.

- Our OPAL building extension is underway and will include a new two storey office building and laboratories and workshops to accommodate 100 nuclear operations staff.

- The Centre for Accelerator Science (CAS) project site works commenced in January 2012. The new centre will be a strong drawcard for Australian and OS scientists from nearly every scientific field working in areas such as radiocarbon dating and environmental studies.

- Proposed development for ANSTO nuclear medicine (Mo-3000) and supporting Synroc facilities – an opportunity for ANSTO to potentially become a lead supplier or Mo-99 globally.
Key point - We are evolving into a modern, open, state-of-the-art centre for science encouraging the best, most talented, most skill people to join us

• As ANSTO’s contribution and influence grows over the coming years, the site will evolve to better reflect our position as a modern, state-of-the-art scientific facility

• ANSTO’s new 2055 site master plan will guide this future development, aiming to create:
  - a modern, user friendly site that grows and develops in a coordinated way
  - a facility that is functionally suited to the many different activities happening at ANSTO now and into the future
  - a scientifically functional and aesthetically appealing facility
  - zones within the site, to bring like activities physically closer together.

• Some of the initial planned changes include:
  - outdoor meeting venues to bring people and ideas together
  - wider interconnecting link roads to aid movement across site
  - centralised parking stations serviced by site commuter buses.

Images clockwise from top left: Outdoor seating area; view down Rutherford Avenue; science lab; and outdoor meeting area