Senate Economics Legislation Committee
Budget Estimates 2011-12
30 May-2 June 2011

Tabled Document No 1

By: Minister Kim Carr

Time/Date: 9:12am, 30/05/11

REVIEW OF THE

CURRENT HEALTH AND SAFETY ARRANGEMENTS AT

ANSTO HEALTH

May 2011

Secretary

Australian Government
Department of Innovation
Industry, Science and Research

Industry House, 10 Binara Street Canberra City ACT 2601
GPO Box 9839 Canberra ACT 2601
Phone: (02) 6213 6650
Fax: (02) 6213 6657
Email: mark.paterson@innovation.gov.au

www.innovation.gov.au
ABN: 74 599 608 295

Senator the Hon Kim Carr
Minister for Innovation, Industry, Science and Research
Parliament House
Canberra ACT 2600

Dear Minister

On 9 February 2011, you commissioned a review into current health and safety practices at the Australian Nuclear Science and Technology Organisation (ANSTO) Health facility, located at Lucas Heights, Sydney. I am pleased to present for consideration the findings of the review.

In undertaking the review, the panel considered the comprehensive documentation provided by ANSTO Health and undertook a two-day site visit to ANSTO Health, including meeting with Board members, senior management and ANSTO Health employees. The panel also met with the independent regulator, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

It is clear there is considerable focus on improving the current culture of health and safety at ANSTO Health. It is also apparent the management of ANSTO and ANSTO Health have instituted an active continuous improvement program to build all aspects of ANSTO Health, including health and safety.

In reviewing the practices at ANSTO Health the panel found there are systems in place to manage radiological safety. Further, the panel did not find evidence that the practices at ANSTO Health breach legislative requirements under the *Australian Nuclear Science and Technology Act 1987*, the *Australian Radiation Protection and Nuclear Safety Act 1998* or the *Occupational Health and Safety Act 1991*.

Although the practices at ANSTO Health have been undergoing a process of improvement over the past couple of years, the panel has made a number of recommendations to assist ANSTO in further advancing health and safety arrangements at ANSTO Health.

I would like to express my gratitude to my colleagues who have worked with me on the review, and all of those who have provided support to us throughout the review process.

I would also like to thank the people from the ANSTO Board, ANSTO, ANSTO Health, ARPANSA and Comcare who have been generous in their time and information to allow us to carry out this review.

I commend this report to you.

Yours sincerely

Mark Paterson AO
Chair
ANSTO Health Review Panel

26 May 2011

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EXECUTIVE SUMMARY

On 9 February 2011, the Minister for Innovation, Industry, Science and Research, Senator the Hon Kim Carr, established a review into the current health and safety arrangements at ANSTO Health.

ANSTO is a Federal Government agency and as Australia's major nuclear research facility has a public good role as well as any commercial role it might undertake.

ANSTO Health is the division of ANSTO with responsibility for producing radiopharmaceuticals to service the medical needs of Australians. ANSTO Health produces about 85 per cent of radiopharmaceuticals used in Australia. Some of its diagnostic radioisotopes are sold to New Zealand and countries in South East Asia.

ANSTO and ANSTO Health operate under a strict regulatory framework including the *Australian Nuclear Science and Technology Organisation (ANSTO) Act 1987*, the *Australian Radiation Protection and Nuclear Safety (ARPANS) Act 1998* and the *Occupational Health and Safety (OHS) Act 1991* and *OHS Regulations*. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) issues licences for ANSTO to operate its facilities and undertakes a range of investigation and reporting regimes. Comcare requires organisations to report in their Annual Reports and to make 'instant notification' in case of severe incidents with increasing timeframes for other incidents. Comcare can investigate an organisation if it feels concerned about occupational health and safety at that organisation.

ANSTO is moving down a transformational pathway to make safety a key priority in ANSTO Health. Good progress has been made but there is still more to achieve. An active continuous improvement program was initiated in 2009 and informs many of the safety changes made over the last two years.

The panel was impressed by the dedication of ANSTO Health employees. The panel noted that the production staff identify closely with hospital patients and feel a strong sense of community service to deliver ANSTO Health radiopharmaceuticals to the Australian public on time.

The panel noted the ANSTO Health production facility is an aging one, where the layout, workflow and equipment are not always optimal for the current levels of production. However, the panel notes that ANSTO Health's licence requires it to be fit for purpose and the panel was advised the facility continues to meet this licensing condition. ANSTO has advised that it has sought to achieve a more modern facility through automation updates and process improvements to improve workflow and reduce manual handling.

ANSTO has in place an Occupational Health, Safety and Environmental (OHSE) Safety Management System (SMS), OHSE policy and OHSE Management Arrangements (OHSEMA). Consultation and risk management are described as the two underlying principles of the SMS.

The ANSTO SMS and framework provides a systematic management approach to assist ANSTO in meeting its legal obligations and to continually improve its OHSE performance. All work related accidents, injuries, illnesses, dangerous occurrences and near misses are required to be reported and investigated.

ANSTO has comprehensive training material, with some material prepared at an organisational level and other material tailored to suit the requirements of ANSTO Health.

On the basis of information provided by Comcare, ANSTO and ANSTO Health, interviews with relevant ANSTO Board members, senior managers, line managers and staff, and interviews and correspondence with ARPANSA, the panel has considered the following:

Safety culture of ANSTO Health is improving
The Board and senior management have made a concerted effort to implement changes to health and safety arrangements over the past two or so years. The panel noted consistent feedback that there has been significant improvement in the health and safety culture, practices and outcomes of ANSTO Health. This was evident in comments from staff at all levels, the ANSTO Board and ARPANSA.

The panel noted there was very close involvement of the senior management in the planning, implementation and monitoring of an improved safety culture at ANSTO Health. However, the panel considers there is merit in delegating some further responsibility for operational implementation of safety to line managers. While still maintaining some operational presence, the role of senior management would then be of a more strategic nature.

There was also concern among some staff that managers do not necessarily have a good grasp of production processes and would benefit from a more "hands-on" approach to improve their understanding of health and safety concerns raised by production technicians.

Systems are in place to manage the radiological safety of ANSTO Health workers
ANSTO's approach to managing radiological safety is detailed in its OHSE Standard on Radiation Safety. ANSTO's basic principles of radiological protection are:

- The benefit should outweigh the risk for any exposure to radiation;
- Exposures should be kept As Low As Reasonably Achievable (ALARA); and
- No exposures should exceed internal limits which are more stringent than the ARPANSA defined limits.

The panel did not find evidence of a systemic failure to manage the risk of radiological exposure at ANSTO Health. In conversations with the panel, staff and management, all interviewees agreed that safety procedures and management systems had improved. The panel is satisfied that systems are in place to provide for the radiological safety of ANSTO Health workers.

Penetration of the "no-blame" culture through the facility
A vibrant safety culture is underpinned by a 'no blame' culture. Senior management appear to have a genuine commitment to a 'no blame' culture and this is apparent in the training and process documents. The tension lies in identifying the difference between well founded and less substantial internal or external complaints. A belief at all levels in 'no blame' is the only way to progress a dynamic safety culture. Timely communication underpins the 'no blame' culture.

Aspects of the 'no blame' culture have been successfully implemented. Staff feel they have the authority to stop production on account of a safety issue. However, the penetration of the 'no blame' culture throughout ANSTO Health appears uneven. The 'no blame' culture has not been fully integrated into ANSTO Health at this time.

There is a need to continue to actively engage with staff to reinforce the 'no blame' message. Disengagement with staff will slow down the process of achieving a uniform acceptance of the 'no blame' culture across ANSTO Health. The panel found that communication could be improved to address the perceptions of some staff who reported disappointment in what they saw was a slowing down of the continuous improvement process. The greater the involvement of people in the continuous improvement process, the greater their willingness to trust management and to have a belief in a 'no blame' culture.

The panel would like to see an even more open approach to reporting. Encouraging ANSTO Health and individuals to feel comfortable in reporting direct to the regulatory bodies

(ARPANSA and Comcare) if they so desire could be a further signal to staff of senior management commitment to the 'no blame' culture which may have a cascading effect at all levels of ANSTO Health. However this should not be a first choice approach but an alternative if internal processes do not address concerns appropriately and in a timely manner.

Repetitive strain injury (RSI)
The trend over the past two years is that RSI injuries have fallen significantly at ANSTO Health, particularly since the introduction of the Peak Health program. However, staff still report major concerns with RSI. The panel observed that technicians are required to work with equipment that needs adjustment to body posture.

The panel observed the Peak Health Program appears to have reduced RSI injuries where core strength of operators is a factor. However, it does not appear to have overcome the full range of RSI injuries, including those caused by a less than ideal workflow layout and by equipment that may benefit from design improvements.

Some staff commented that they would like to see a broader range of strategies put in place to counter the full range of repetitive strain injuries. The panel observed that staff considered RSI injuries, and not radiological exposure, as the bigger threat to their welfare.

Capital and Infrastructure
If ANSTO Health is to meet Australian and regional demand for radioisotopes in the future, greater emphasis will have to be placed on how the facility can handle changing production levels. A strategic approach to upgrading the facility should focus on developing a short, medium and long-term outlook for ANSTO Health infrastructure.

There does not appear to be any extra capacity in the number of hot cells to maintain production during equipment breakdown. This can result in an increased risk of RSI if staff work longer hours or extra shifts to increase production. Repair under circumstances where equipment has not had sufficient time to "cool down" is more time consuming as employees must take the precaution of dressing in protective clothing. This in turn, results in a further slow down in the production schedule.

Maintenance
Although there are maintenance plans in place and an upgraded maintenance project in train, staff argue that maintenance is only undertaken for the most urgent matters. There does not appear to be sufficient capacity for more long term and strategic maintenance work to be done.

The panel noted that it is difficult to sustain maintenance staff levels in ANSTO Health because of the shortage of suitably qualified and skilled people. There is only one nuclear research reactor facility in Australia, so ANSTO may have to further develop a significant training program as part of their recruitment strategy.

Safety and reporting
The panel noted the increased levels of reporting in ANSTO Health. This has come about from the policy decision that all incidents and near hits are reported. It was noted that increased reporting does not necessarily reflect an increase in incidents but rather greater attention to safety and a lowering of radiation level required reporting. ANSTO is also applying a lower threshold interpretation for regulatory notifications to Comcare.

Additional reporting and the recently introduced automated reporting system lead to greater ease in collecting and analysing safety data. This information linked with the continuous improvement process can lead to the introduction of more effective safety measures. Automated reporting could also support the proper implementation of a 'no blame' reporting culture.

Staff members commented the inaccurate media reporting of the seriousness of radiological incidents undermines ANSTO's reputation and the important role it plays in providing radiopharmaceuticals to the Australian public.

Regulatory framework and reporting
ARPANSA and Comcare appear to have different, but at times corresponding, responsibilities in terms of radiological safety.

The panel endorses a closer relationship between ARPANSA and Comcare to ensure a consistent message in relation to radiological safety for ANSTO. In the short term, ARPANSA may like to consider providing training in the complex area of radiological safety to Comcare officers who work with ANSTO.

ARPANSA and ANSTO have regulatory requirements governing release of information. All radiological incidents reported to ARPANSA which breach the Act or licence conditions are tabled in parliament. The panel believes that the interpretation of this information could be better contextualised by including supporting documentation which provides commentary about the risk profile of each incident report. Such a document would allow clearer reflection upon the degree of risk for individuals.

The panel encourages ANSTO Health to continue reporting all radiological incidents to ARPANSA, even if the incidents are well below the required reporting levels.

ARPANSA is focussing on building a collaborative approach to resolving non-compliance. An approach which examines even minor incidents can help discover patterns of behaviour and lead to improvements in radiological safety.

Audit and Risk Committee
The panel appreciated the interaction with Chairman of the Board and the Chair of the Audit and Risk Committee. The panel reviewed a number of documents that are provided to the Board and cover the scope of OH&S within ANSTO Health. The panel observed that the size and composition of the Audit and Risk Committee militates against it separating itself sufficiently from the Board. The panel felt that a smaller subcommittee that met at regular, independent times from the Board, with regular reporting to the Board would be more targeted. Separation of Audit and Risk subcommittee meetings from regular Board meetings provides benefits for both the Audit and Risk subcommittee and the Board itself. The greater separation will allow the Board to focus more clearly on the strategic direction of ANSTO.

RECOMMENDATIONS

Recommendation 1
The panel recommends, as a means of further embedding the safety culture at ANSTO Health, that senior executives devolve some further operational implementation and responsibility for safety to line managers. While still maintaining some operational safety presence, the role of senior management would then be to examine any trends and take a more strategic oversighting role.

Recommendation 2
The panel recommends ANSTO Health consider the value of introducing a program where management would spend some time working alongside experienced technicians to improve their practical understanding of production processes and the safety concerns raised by production technicians. The panel considers greater visibility and practical involvement of senior management would demonstrate a 'walk the talk' approach as well as an openness in staff communication.

Recommendation 3
The panel recommends ANSTO Health continue to explore the reasons why incidents of radiological exposure are higher in the Quality Control (QC) laboratory and implement changes to practices, layout or equipment to lower exposure levels in the QC laboratory.

Recommendation 4
The panel endorses ANSTO Health's commitment to the continuous improvement process and recommends that ANSTO Health ensures the committees contributing to the continuous improvement process continue to meet and take action so that continuous improvement is embedded in all processes at ANSTO Health, including an active role for the ANSTO Health OH&S Committee.

Recommendation 5
The panel recommends that ANSTO Health introduces a greater variety of feedback mechanisms to enhance staff's willingness to accept their role in the effectiveness of the continuous improvement process.

Recommendation 6
The panel recommends management's commitment to a 'no blame' culture is reinforced by timely feedback. The feedback should be provided specifically to impacted staff members and then to all ANSTO Health employees on all incidents and broader safety concerns.

Recommendation 7
The panel acknowledges the Peak Health Program has had major benefits in decreasing RSI injuries. However, the panel recommends ANSTO Health consider a wider range of strategies to address RSI occurring at ANSTO Health including engaging external assessments by occupational health and safety experts.

Recommendation 8
The panel recommends ANSTO Health continue to focus on the safety upgrade continuous improvement project and, where possible, equipment redesign and replacement.

Recommendation 9
The panel acknowledges the work that ANSTO and ANSTO Health have already undertaken towards automating processes and redesigning the workflow of the facility. However the panel recommends ANSTO consider the benefits of purchasing additional capacity to provide a fallback when equipment breaks down at ANSTO Health.

Recommendation 10
The panel recommends that ANSTO upgrades maintenance services to the radiopharmaceutical production facility.

Recommendation 11
The panel recommends that maintenance planning and action become part of the strategic focus on upgrading the facility, focusing on developing a short, medium and long-term maintenance strategy that incorporates recruitment and training of adequate staff for ANSTO Health's maintenance capability requirements.

Recommendation 12
The panel recommends that ANSTO Health develops a proactive plan in relation to maintenance staff recruitment and training in the short, medium and long term and report on this plan to the Board at regular intervals.

Recommendation 13
The panel supports a more structured reporting system comprising three components:

- Incident reporting should be actively encouraged;
- The context of the incident report, report investigation and feedback to management and staff on the outcome should be provided in a timely manner; and
- Reports would clearly identify (a) performance against accepted ANSTO benchmarks and (b) where there had been a breach of regulatory limits/legislation.

The panel acknowledges the first component of this system is becoming established at ANSTO Health. However, the panel considers the process of providing feedback to relevant staff and management could be improved and the implementation of the third component would assist in making reporting more meaningful and useful in the continuous improvement context.

Recommendation 14
The panel considers there is a case for ANSTO to increase its education of the general public about radiological exposure.

Recommendation 15
The panel encourages the development of a formal agreement between Comcare and ARPANSA that clarifies organisational responsibilities for investigating and evaluating radiological incidents at ANSTO.

Recommendation 16
The panel encourages ARPANSA to continue examining relevant legislation and regulations with a view to providing a more proportionate response to incidents that do not comply with the Act or licencing conditions. For all reports tabled in parliament, the panel encourages the inclusion of supporting documentation which provides commentary about the risk profile . The panel considers the inclusion of supporting documentation that provides commentary would assist in educating the general public on radiation safety.

Recommendation 17
The panel encourages ARPANSA to continue to build a collaborative relationship with ANSTO Health to encourage disclosure of all incidents so as to reinforce the continuous improvement program at ANSTO Health.

Recommendation 18
The panel recommends

- The membership of the Audit and Risk subcommittee should be reduced;
- Greater emphasis should be placed on risk by this committee;
- Directors with relevant specific expertise are invited to attend as required;
- Meeting times are separated from Board meetings to allow a greater separation of duties; and
- Audit and risk reports continue to be part of the agenda for every Board meeting.

CHAPTER 1 – REPORT INTRODUCTION

On 9 February 2011, the Minister for Innovation, Industry, Science and Research, Senator the Hon Kim Carr established a review into health and safety arrangements at ANSTO Health. The terms of reference for the review are at **Attachment A**.

The Minister appointed a prominent panel to undertake this review. The panel was chaired by Mr Mark Paterson AO, Secretary of the Department of Innovation, Industry, Science and Research. Members of the panel are Dr Jim Peacock AC, a CSIRO Fellow and former Chief Scientist for Australia, Mr Grahame Cook PSM, Director of Allen Consulting and a former ANSTO Board member, and Mr Tim Ayres, the NSW Secretary of the Australian Manufacturing Workers Union. Biographies of the panel members are at **Attachment B**.

The panel determined the review would not be a forensic examination of the health and safety policies and procedures at ANSTO Health. Rather, the review would be an exploration of the current state of health and safety arrangements at ANSTO Health, with close attention paid to policies, practices and behaviours that lead to compliance with legislative and regulatory requirements with the ARPANSA licence, the Australian Radiation Protection and Nuclear Safety legislation and the *Occupational Health and Safety Act 1991* (OHS Act 1991). The review also examined the role and responsibilities of directors and senior and line management in creating a safe working environment for employees.

The review focused on current activities at ANSTO Health. In doing so, the review examined occupational health and safety arrangements at the facility over the last two years. While the outcomes of previous reviews undertaken by ANSTO, ARPANSA and Comcare were made available to the panel for contextual purposes, the panel considered these matters outside the scope of the review.

The panel approached the review through a number of different pathways. At the panel's request, ANSTO Health provided a great deal of information to the panel for review, including comprehensive documentation on the OHSE framework and training examples as well as a range of planning, strategic and structural documents for ANSTO Health.

The panel undertook a two day site visit where they visited the production facilities. They met with Board members, senior managers, line managers, OH&S staff, training staff, technicians and production staff. The site visit program is at **Attachment C**. A list of ANSTO and ANSTO Health employees who formally met with the panel is at **Attachment D**.

The panel also met with the independent regulator, ARPANSA, including its CEO, Dr Carl-Magnus Larsson, Mr Ian Graham and Ms Patricia Cabrera. Through correspondence, ARPANSA provided additional information and greater details of issues discussed at the meeting.

Departmental staff met with Comcare representatives who provided an overview on ANSTO's health and safety performance for the period 2006 – 2011, with a breakdown of data to the ANSTO Health level where possible. Comcare also provided general information on what constitutes a safety culture and OHS audit tools.

The report provides background information on ANSTO, ANSTO Health and the regulatory framework in which ANSTO and ANSTO Health operates. The report also provides a summary of radiological safety measures in place at ANSTO Health and a summary of health and safety policies and procedures in place to ensure ANSTO Health complies with relevant legislation. The final chapter details the areas of inquiry of the review and provides recommendations for improvement in health and safety practices at ANSTO Health.

CHAPTER 2 - BACKGROUND INFORMATION ON THE AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

Australian Nuclear Science and Technology Organisation

ANSTO is Australia's national nuclear research and development organisation, and the centre of Australia's nuclear expertise. ANSTO's core functions are to:

- Conduct research and development in relation to nuclear science and technology;
- Produce and use radioisotopes, isotopic techniques and nuclear radiation for medicine, science, industry, commerce and agriculture;
- Encourage and facilitate the application and use of results from research and development;
- Manage radioactive materials and waste arising from various prescribed activities;
- Provide goods and services related to core activities;
- Provide advice to government and undertake international liaison in nuclear-related matters;
- Make available, on a commercial basis where appropriate, facilities, equipment and expertise for research in nuclear science and technology; and
- Publish scientific and technical reports, periodicals and papers, and provide public information and advice.[1]

ANSTO houses the Open Pool Australian Lightwater (OPAL) reactor, Australia's only nuclear research reactor, which when opened in 2007 replaced the High Flux Australian Reactor (HIFAR).

Unlike its predecessor HIFAR, OPAL utilises low enriched uranium to produce neutrons for a number of in-situ applications. Neutrons from OPAL are also used in two accelerators, the Australian National Tandem Research Accelerator (ANTARES) and Small Tandem for Applied Research (STAR) accelerator. In addition, cold neutron beams are used from OPAL in the ANSTO beam hall, which currently houses seven functional beam lines[2].

ANSTO's subsidiary, Petnet Australia Pty Ltd operates twin cyclotrons, which are used to produce fluorine-18, a short-lived radioisotope used in Positron Emission Tomography (PET), a form of medical imaging.

ANSTO was created in 1987, when it superseded the Australian Atomic Energy Commission (AAEC), and is governed by the *Australian Nuclear Science and Technology Act 1987* (the ANSTO Act).

The ANSTO Act stipulates that ANSTO shall have a Board consisting of at least five, but not more than eight directors, one of which will be appointed Chairperson. The function of the Board is to ensure the proper and efficient performance of the functions of the Organisation. Board members are appointed by the Governor-General, and in turn the Board appoints a CEO to manage the facility. The CEO holds an *ex-officio* position on the board, under the ANSTO Act.

ANSTO employs 1102 full-time equivalent staff (as at 13 May 2011), and in the 2009-10 financial year had a budget of almost $235 million, including external income exceeding $70 million.[3] It delivers its research through four Institutes, the Bragg Institute, the Institute for Environmental Research, Institute of Materials Engineering and ANSTO LifeSciences. An organisational structure is provided at Diagram 1.

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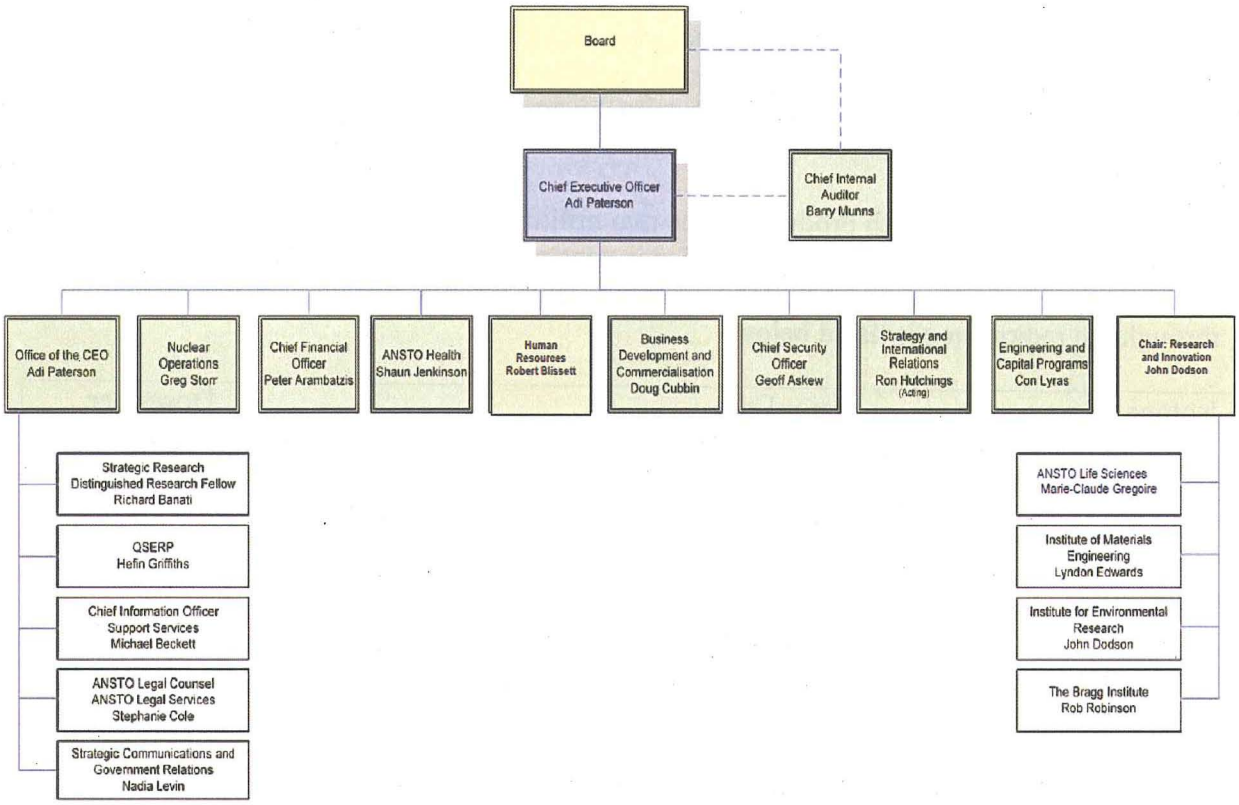
[1] *Portfolio Budget Statements 2011-12*, Innovation, Industry, Science and Research portfolio, p143
[2] *ANSTO Annual Report 2009-2010*, p32.
[3] *ANSTO Annual Report 2009-10*, p56

Diagram 1: ANSTO Organisational structure[4]



ANSTO has seven main areas of focus. They are:

- Climate change research;
- Materials engineering;
- Atmospheric monitoring;
- Australia's nuclear reactor;
- Nuclear medicine;
- Neutron scattering; and
- Government and international liaison.

[4] Organisational structure as at May 2011

ANSTO Health

ANSTO Health manufactures nuclear medicines also known as radiopharmaceuticals. These medicines have been labeled with radionuclides (also referred to as radioisotopes). Nuclear medicines are used diagnostically to make an accurate diagnosis of an illness, or therapeutically to treat diseased organs or tumours.

Every year, ANSTO Health produces some two million doses of radioisotopes for diagnostic and treatment purposes, supporting around 85 per cent of the nuclear diagnostic procedures carried out in Australia each year[5]. ANSTO Health provides a range of radiopharmaceutical products, through the radioisotopes listed below:

Isotope	Major Uses	Doses per annum
Molybdenum-99 (decays to Technetium-99m)	Diagnostic two-dimensional imaging for various tissues, organs and bone	2,066,549
Iodide-131	Treatment of hyperthyroidism	22,382
Iodine-123	Detection, staging and follow-up on therapy of neuroblastomas	688
Chromium-51	Investigating renal function	667
Gallium-67	Diagnosis and extent of Hodgkin's disease, lymphomas and bronchogenic carcinoma and detection of some acute inflammatory lesions	8,726
Thallium-201	Diagnosis and localisation heart disease and damage	15,050
Samarium-153	Relief of bone pain in patients with bone metastases	57
Indium-111	Used as a diagnostic to examine cerebral spinal fluid movement within the brain and spinal canal[6]	10
Yttrium-90	Yttrium 90 is imported and used in the manufacturing process for Sir Spheres: SIR-Spheres are used for the treatment of non-resectable liver tumours	Not available[7].

ANSTO Health provides 100 per cent of the Molybdenum-99 currently used in Australia, and also exports this radioisotope, which is highly significant given its demand internationally. ANSTO Health supplies Molybdenum-99 radiopharmaceuticals to its customers in Gentech Generators. On average, ANSTO Health distributes 110 generators per week, every week of the year.

In 2009-10, in the course of producing these radiopharmaceuticals, ANSTO Health had one breach of its licence and 56 radiological events or near misses. The licence breach was a technical breach and occurred when an overseas supplier sent ANSTO Health a quantity of radioisotope that exceeded ANSTO Health's licence conditions. None of the radiological events were at a level that required reporting to the regulator. They were all of a minor nature or a near miss event.

[5] http://www.ansto.gov.au/business_services/ansto_health/about_ansto_health

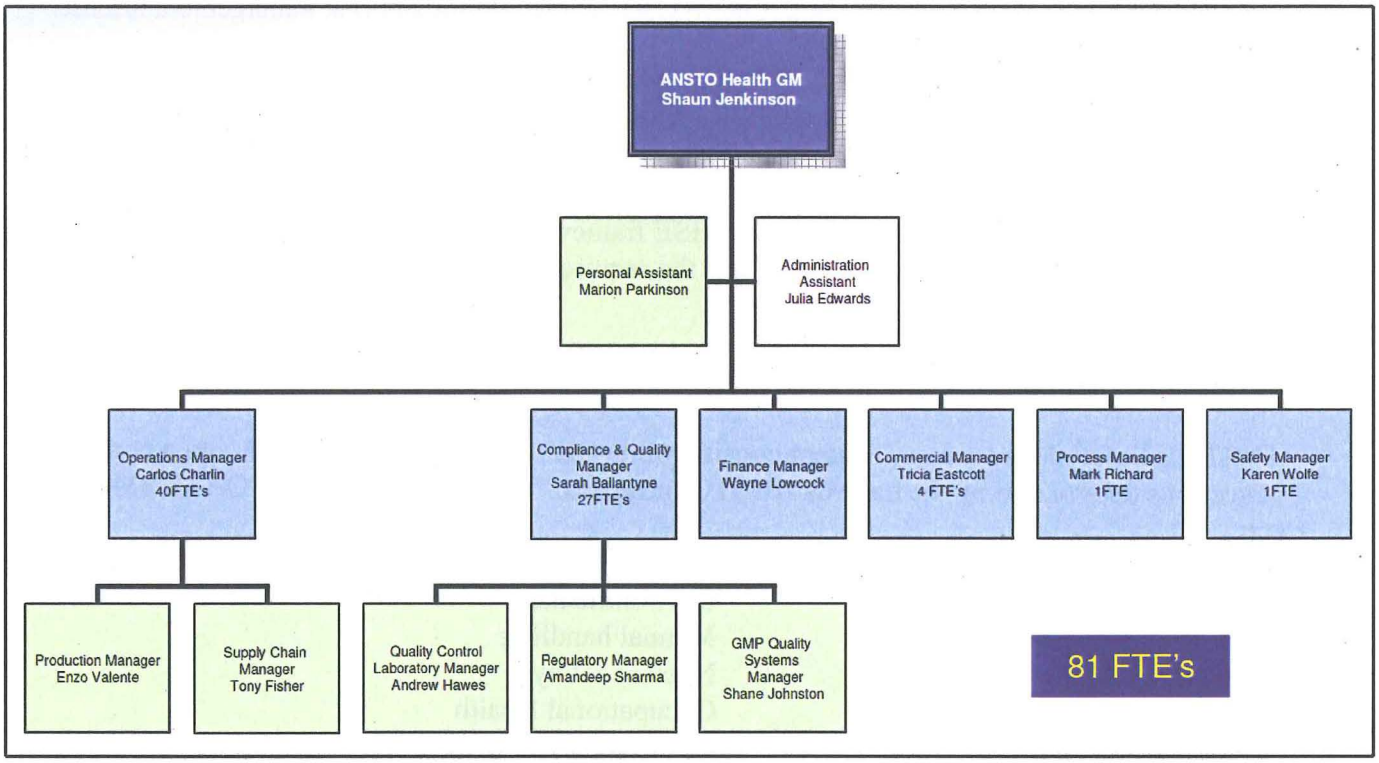
[6] Information used to prepare this table was sourced from the ANSTO Health radiopharmaceuticals website at http://www.ansto.gov.au/business_services/ansto_health/radiopharmaceuticals.

[7] ANSTO Health manufactures Sir-Spheres under contract for Sirtex Medical Ltd

As a result of the short half-life of a number of radioisotopes produced at ANSTO Health, processing and delivery of products is highly time sensitive, with delays affecting the efficacy of products. Production and delivering of clinical isotopes on a commercial scale provides challenges for ANSTO Health.

ANSTO Health is supported by a highly skilled, specialist workforce, with 81 full-time equivalent positions at the facility. The technical skills and specialist knowledge required of staff at ANSTO Health, and at ANSTO generally, means that the recruitment of staff can be difficult and time intensive. The organisational structure for ANSTO Health is provided in Diagram 2.

Diagram 2: ANSTO Health organisational structure



Regulatory environment

As well as being regulated by the ANSTO Act, the Organisation is required to abide by a number of other legislative instruments, including the *ARPANS Act 1998, OH&S Act 1991,* as well as the *Australian Radiation Protection and Nuclear Safety Regulations 1999* and the *Occupational Health and Safety (Safety Standards) Regulations 1994.* ANSTO, like other publicly funded research organisations, is also bound by the *Commonwealth Authorities and Companies Act 1997.* A variety of other legislative requirements are applicable to ANSTO which are outside the scope of this review.

ANSTO, in carrying out its functions, is also regulated by a number of organisations, including the Australian Safeguards and Non-Proliferation Office (ASNO), ARPANSA, the Therapeutic Goods Administration (TGA) and Comcare.

CHAPTER 3 - OCCUPATIONAL HEALTH AND SAFETY ARRANGEMENTS AT ANSTO HEALTH

Introduction

ANSTO has a legislative obligation to ensure the health and safety of its employees in the workplace. At a high level, ANSTO acknowledges this obligation through the 2010-15 Strategic Plan, where it identifies "safety, security and environmental sustainability" as a core value of the organisation[8].

In practical terms, ANSTO has in place an Occupational Health, Safety and Environmental Management (OHSE) Safety Management System (SMS), OHSE policy, the "blue umbrella" and OHSE Management Arrangements (OHSEMA). Consultation and risk management are the two underlying principles of the SMS.[9]

These arrangements have been put in place by ANSTO to comply with its legislative obligations under the *OH&S Act 1991* and the *ARPANS Act 1998*.

ANSTO Health operates within ANSTO's OHSE framework, and where appropriate, components of that system are tailored to suit the requirements of a radiopharmaceutical production facility.

OHSE policy framework

ANSTO's Safety Management System consists of its OHSE policy, its OHSEMA and a number of sections determined by the hazards ANSTO mitigates. The 12 sections of the OHSE SMS are:

OHSE Management	Environmental
Risk management	Manual handling
Chemical safety	Nuclear safety
Contractor safety	Occupational Health
Electrical safety	Plant safety
Emergency planning	Radiological safety

The ANSTO SMS and OHSE framework provides for ANSTO and ANSTO Health to meet their legal obligations in respect of the *OH&S Act 1991* and the *ARPANS Act 1998*. The systematic approach to OHSE also provides for review to enable continual improvement in ANSTO and ANSTO Health's OHSE performance.

Each section of the SMS contains an ANSTO Standard and ANSTO Practices. The ANSTO Standard is the overarching document that outlines ANSTO's principles to assist employees at ANSTO to create and maintain a safe workplace and to deliver excellence in OHSE performance. The ANSTO Practices are the practical "how to" documents, including guides, flowcharts, checklists and forms, that assist ANSTO employees to implement the SMS.

ANSTO's SMS is based on Australian/New Zealand Standard (AS/NZS) 4804:2001: *Occupational health and safety management systems – General guidelines on principles, systems and supporting techniques.*

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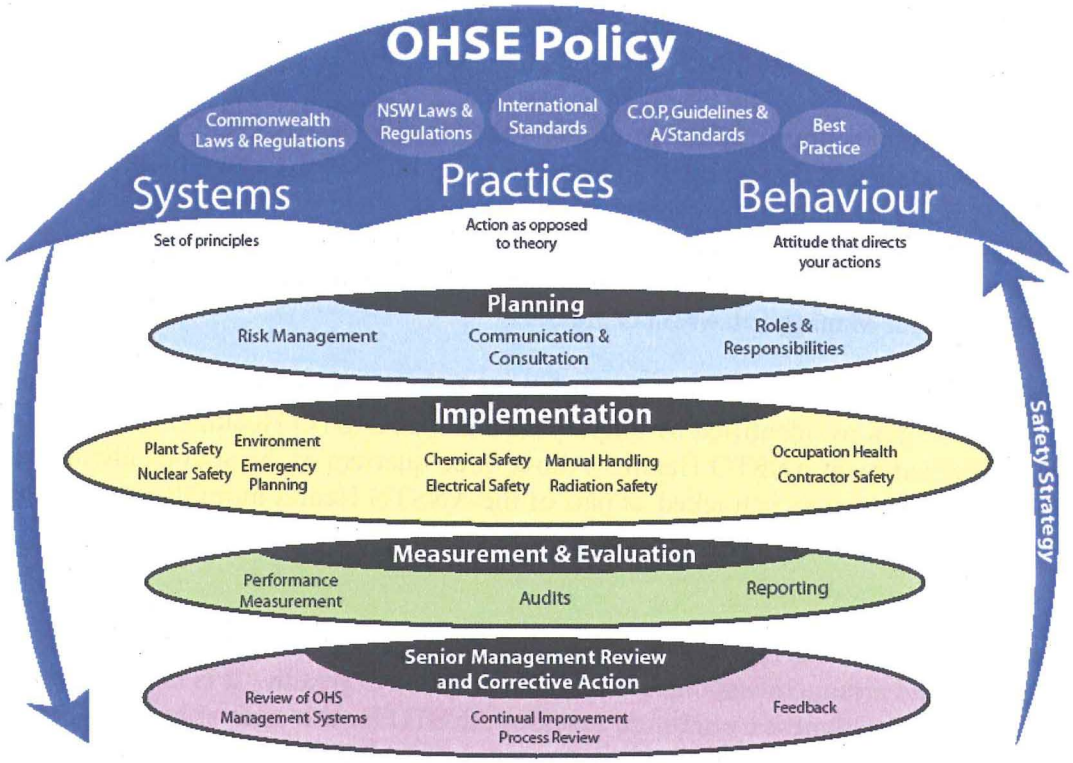
[8] ANSTO 2010-15 Corporate Plan, p7

[9] ANSTO Occupational Health, Safety and Environmental Management Arrangements (OHSEMA) p 1

Diagram 1: ANSTO OHSE policy framework – the 'blue umbrella'



The OHSE policy framework is predicated on continually improving the processes, procedures, systems, standards and targets that comprise the safety management system. This improvement is to be undertaken using a blame-free learning approach and involve consultation with key stakeholders. The policy acknowledges the need for a knowledge development and transfer program, leadership, monitoring and auditing of ANSTO's OHSE performance.

Reporting of safety events

ANSTO's SMS requires all work related accidents, injuries, illnesses, dangerous occurrences and near misses to be reported and investigated. The level of investigation undertaken depends on the actual and potential severity of the event. The Event Response Matrix categorises events from insignificant to severe and provides practical guidance to assist employees and supervisors to determine the type of investigation to be undertaken and the timeframe for completing the investigation.

ANSTO advises the purpose of reporting events and near misses is not to apportion blame. The increase in reporting of insignificant and minor events provides ANSTO with the opportunity to proactively implement health and safety solutions and reduce the risk of a moderate or higher rated event occurring in the future.

The panel was advised that other recent changes implemented at ANSTO Health to assist in event reporting process include the introduction of electronic event reporting and a site wide focus on closing events to ensure timely follow-up on events.

Continuous improvement program at ANSTO Health
In documentation provided by ANSTO for the review, it is stated that in early 2009 "there was evidence of conflict over safety in ARI, but no evidence of systemic failure of controls". At the August 2009 meeting, the ANSTO Board agreed to the implementation of a continuous improvement program at ANSTO Health.[10]

The purpose of the continuous improvement program was to re-engage ANSTO Health staff, the support services functions, ANSTO technical and engineering staff and the assurance function in a process that would bring about cultural change in relation to productivity and safety. A Steering Group was established to oversee the program and comprises: the CEO, General Manager of Engineering and Capital Programs, Manager, Safety Environment and Radiological Assurance and the General Manager of ANSTO Health.[11]

The Safety Upgrade Project was a result of the Continuous Improvement Program. This Project identified 80-plus tasks/actions, identified by employees and the ANSTO Health OHSE Committee to improve safety at ANSTO Health. About three-quarters of the actions identified have been completed and progress is tracked as part of the ANSTO Health monthly management meeting with updates displayed on notice boards.

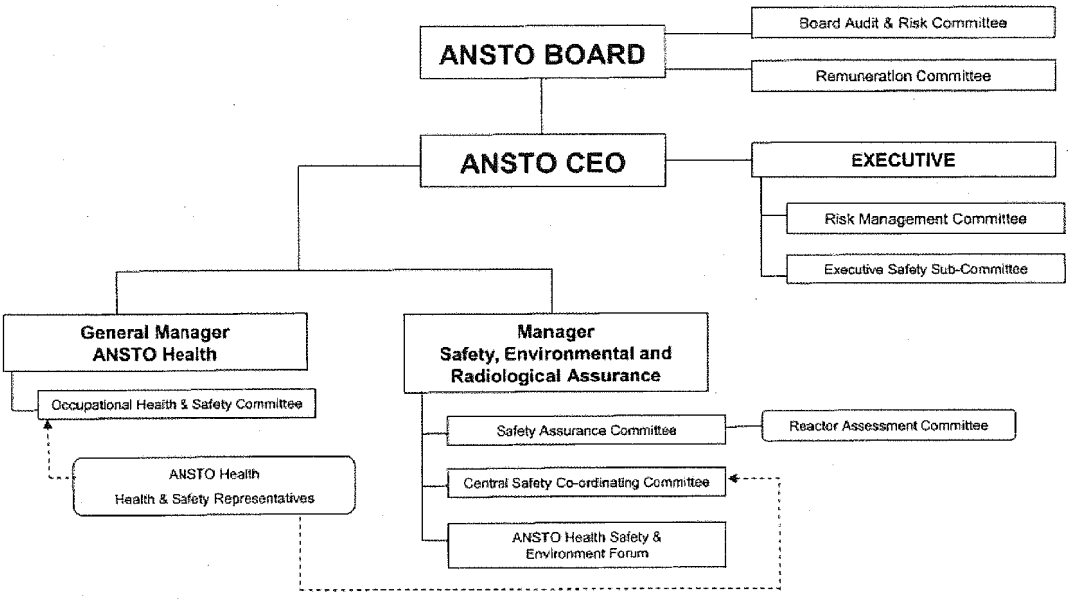
Safety Analysis Report
The Safety Analysis Report is a comprehensive report of all the overarching safety systems, processes, equipment and arrangements that are in place at ANSTO Health. It is the document that the ANSTO Safety Assessment Committee assesses ANSTO Health against before providing the facility approval to operate and it is the document ARPANSA assesses ANSTO Health against before issuing a licence. The Safety Analysis Report is reviewed on a five year basis to ensure documentation is current and to reflect improvements made to ANSTO Health operations over the past five years.

[10] *The Current Context of ANSTO Health: Safety, continuous improvement and associated cultural change over the last two years,* ANSTO Executive , p2
[11] Ibid, pp2-3

OHSE committees and consultative forums

The governance arrangements for OHSE across ANSTO are shown in Diagram 2.

Diagram 2: ANSTO OHSE governance arrangements



The panel considers the roles and responsibilities of the ANSTO Board and ANSTO staff are addressed in the OHSE governance arrangements in place. The panel is also of the view that the training and development offered to directors, senior management, relevant line managers and ANSTO Health staff provides relevant information for them to have an understanding of their roles and responsibilities in terms of occupational health and safety.

Staff training and development

The training and development of ANSTO Health employees is managed at three levels within ANSTO: through ANSTO Organisational Development and Learning (OD & L); the Safety, Environment and Radiological Assurance (SERA); as well as tailored programs to suit the local requirements of ANSTO Health employees.

ANSTO Organisational Development and Learning provides ANSTO Induction training and all ANSTO Health employees must complete induction training.

Induction training includes the New Starter Induction Program which is a two day training program that covers: safety induction; manual handling; chemical safety; and code of ethics and workplace behaviour. This Program is undertaken on the first two days of employment at ANSTO.

Further training is then undertaken in the First Days/First Weeks New Employee Induction Training. This training focuses on inducting the employee into their work area and covers safety and business processes[12]. In the case of ANSTO Health employees, the First Days/First Weeks New Employee Induction Training commences on their first day of work at ANSTO Health and must be completed within three months of commencing employment with ANSTO.

Safety, Environment and Radiological Assurance offers training courses to provide the necessary information, instruction, training and supervision to allow employees to meet their

[12] Training of ANSTO Health Production Technicians, ANSTO, pg 1

responsibilities under the OHS legislation and undertake their work safely and without risk to themselves or other workers. Such training includes: radiation safety, manual handling; and control of chemical hazards[13]. This training is undertaken as part of the Induction programs and refresher courses are undertaken throughout employment as per the OHSE Courses and Retraining Requirements Guide.

ANSTO Health has a dedicated Safety Manager, whose role includes training, and a Knowledge and Training Officer. ANSTO has comprehensive documentation on the training requirements for ANSTO Health employees, consolidated in the "Training at ARI" procedural guide.

Each ANSTO Health employee is assigned a training profile, which is a suite of training courses. The training profile of an employee will vary depending on an individual's job tasks, role and responsibilities, and their prior experience.

All ANSTO Health employees must undertake the ANSTO Health core curriculum courses, which includes induction training, various Good Manufacturing Process courses, ANSTO Health Quality Policy, ARPANSA overview, safety related event/incident reporting and evacuation and emergency procedures. There is a core set of training courses that must be completed prior to an employee being allowed unsupervised access to Building 23A, including radiation safety training.

A production technician at ANSTO Health is required to complete upwards of 70 curriculums specific to their role. Such courses include Operating Procedures for the Hot Cells in Building 23A, Operation and Use of Tongs/Manipulators, Human Kinetics and Lifting Techniques and Peak Health Training and Exercise.

Training may comprise practical, on-the-job training, toolbox talks – a practical talk from an employee on safety, theoretical or face-to-face training and on-line and self-paced modules. All training activities are documented. Competency is assessed via practical assessment of tasks and completion of formal competency based training packages. ANSTO might like to consider developing training packages that lead to a TAFE Certificate IV qualification such as 'Nuclear Safety' or 'Nuclear Maintenance'.

Supervisors are responsible for reviewing training compliance of employees and to take action to ensure that training compliance is maintained. Individual employees are also responsible for ensuring their training records are current and applicable to their current roles and responsibilities. ANSTO Health has in place procedures to ensure that employees who have not undertaken prerequisite training are appropriately supervised while in Building 23A.

The panel notes the comprehensive nature of training and development material that ANSTO and ANSTO Health have developed. The panel found there has been considerable improvement in the training and development arrangements offered at ANSTO.

Radiological safety at ANSTO health

ANSTO's approach to managing radiological safety is detailed in its OHSE Standard on Radiation Safety. ANSTO's basic principles of radiological protection are:

- The benefit should outweigh the risk for any exposure to radiation;
- Exposures should be kept As Low As Reasonably Achievable (ALARA); and
- No exposures should exceed internal limits which are more stringent than the ARPANSA defined limits.

[13] Training of ANSTO Health Production Technicians, ANSTO, pg 1

ANSTO has in place a Radiation Protection Program that comprises personal dosimetry; portable radiation and contamination monitoring; radiation protection surveillance of areas and activities; radiological classification of areas; and radiation monitoring systems.

ANSTO Health provides two types of devices to measure personal doses. The thermo-luminescent dosimeter (TLD) measures the radiation doses to an individual's body and the measurement is read every month for production facility workers or every three months for employees in office or administrative roles. ANSTO Health employees must always wear their TLD when at work. Electronic personal dosimeters (EPD) are also used for informal monitoring of individual doses. The EPD measures radiation dose and dose rate and the dose can be read from the screen of the device.

Safety clothing, such as laboratory coats, overshoes and disposable gloves, are worn by ANSTO Health employees when they are in the product manufacturing and quality control areas of the facility to minimise radiation exposure. Prior to exiting the facility, employees remove safety clothing and then utilise a hand and foot monitor, to measure any radiation contamination.

The ANSTO Health production facility also has in place fixed radiation detectors and portable radiation detectors to assist in preventing radiation and contamination hazards.

There is an ongoing process of monitoring and reviewing radiation controls and practices within ANSTO Health. Workplace monitoring programs provide information that allows evaluation of radiation conditions, assessment of actual and potential exposures and an ongoing review of classification of areas. The area monitoring program provides for a scheduled monitoring program, but it can also be task specific, for example, an ALARA assessment of a new or improved process.

In early 2011, ANSTO Health established a Radiation Safety Improvement Team (RSIT). The purpose of the RSIT is to identify improvements in radiation safety in ANSTO Health with a focus on contamination control improvement, radiation safety assurance, ALARA improvements, reporting of incidents or near misses, and other specific projects. Some of the specific projects include: best practice for wearing personal protected equipment; reviewing the entry/exit barrier area and improving quality control work practices to reduce contamination.

ANSTO has also engaged MPR & Associates Inc, an American company specialising in nuclear engineering and solutions, to undertake a review of radiological and general safety at ANSTO Health. The review will cover the period from January 2009 to May 2011.

In 2009-2010, ANSTO Health had one breach of its licence and 56 radiological events or near misses. The licence breach was a technical breach and occurred when an overseas supplier sent ANSTO Health a quantity of radioisotope that exceeded ANSTO Health's licence conditions. None of the radiological events were significant. They were all of a minor nature or a near miss event. To put this in context, the one breach and 56 radiological events or near misses occurred over a period when some two million doses of radioisotopes were produced.

Conclusion

Based on the information provided by ANSTO and discussions with ANSTO and ANSTO Health representatives, the panel has come to the conclusion that ANSTO Health has in place policies and procedures that provide for compliance with the *OH&S Act 1991* and the *ARPANS Act 1998*.

CHAPTER 4 – KEY AREAS OF INQUIRY

ANSTO Health is working towards a transformational change in its workplace culture so that safety becomes the number one priority in the production facility.

On the basis of information provided by Comcare, ANSTO and ANSTO Health, interviews with relevant Board members, senior managers, line managers and staff, and interviews and correspondence with ARPANSA, the panel has concluded:

- the health and safety culture at ANSTO Health continues to improve, following the implementation of a number of enhancements to health and safety arrangements over the past two years;
- systems are in place to provide for radiological safety at ANSTO Health;
- there is a need for greater penetration of the 'no-blame' culture through ANSTO Health;
- there is a need to reduce repetitive strain injuries (RSI);
- the infrastructure of ANSTO Health would be improved with additional capacity to provide a fallback when equipment breaks down;
- maintenance services could be expanded to ensure a focus on both routine maintenance and strategic upgrades;
- reporting, including regulatory reporting, is a key tool which can be refined to encourage a greater focus on safety and to further the 'no blame' culture; and
- a greater focus on risk within the organisation may be achieved if the Board considers reshaping the Audit and Risk Sub-Committee.

Each of these conclusions is discussed in more detail below and where appropriate, the panel has made recommendations.

Safety culture of the organisation is improving

ARPANSA says 'Safety culture can be viewed as a multilevel phenomenon of organisational dimensions, social processes and psychological states of the personnel. The essence of the safety culture is the ability and willingness of the organisation to understand safety, hazards and means of preventing them, as well as the ability and willingness to act safely, prevent hazards from actualising and promote safety. Safety culture refers to a dynamic and adaptive state.'[14] ARPANSA's comment emphasises the complexity of introducing change in safety culture and maintaining it as a high priority.

The Board and senior management have made a concerted effort to implement changes to health and safety arrangements over the past two or so years. The focus has changed from a technocratic approach to one of continuous improvement. Mr Hefin Griffiths, Manager of the ANSTO wide Safety, Environmental and Radiological Assurance (SERA) team outlined[15] many strategies that had been implemented as part of the continuous improvement process across ANSTO including:

- Establishing a Radiation Protection Program;
- Establishing Workplace and Area monitoring programs;
- Radiological safety measures built into the daily practices of staff members;
- Controlling internal radiation hazards through engineering and administrative changes and personal protection equipment;
- Defining processes for managing equipment failure and actual radiation exposure; and
- Establishing a Radiation Safety Improvement Team.

The panel noted consistent feedback that there has been significant improvement in the health and safety culture, practices and outcomes of ANSTO Health. This was evident in comments

[14] ARPANSA letter, p3
[15] Presentation by Mr Hefin Griffiths 'Radiological assurance across ANSTO', 11 April 2011

from staff at all levels, the ANSTO Board and ARPANSA. Safety is specifically described as a core value in the ANSTO Corporate Plan.[16] ARPANSA interprets the increase in incident reporting as attributable to the change in internal reporting procedures and not necessarily as an increase in radiological incidents. ARPANSA concludes 'While not conclusive, these factors can be indicative of improvements to safety culture. Any such improvements need to be assessed over time and with regard to other organisational issues and processes within the facility'.[17]

Comcare statistics are also indicative of an improving safety culture and show specifically a decreasing trend for ANSTO Health in the number of accepted claims for financial years from 2006-07 to 2010-11. There has also been a reduction in the Comcare premium for ANSTO.[18] ANSTO's reports to the Board also noted the strategy of applying a lower threshold interpretation for regulatory reporting to Comcare. The reports note that a lower threshold may lead to an increase in notifications to Comcare and also serves to increase regulatory assurance as well as increasing investigating and rectifying identified issues.

The panel commented on the very close involvement of the senior management in the planning, implementation and monitoring of an improved safety culture at ANSTO Health. The International Atomic Energy Agency (IAEA) has released *Safety Culture Assessment Review Team (SCART) Guidelines* which emphasise the importance of senior management commitment to safety and visible leadership showing the involvement of management in safety related activities.[19] The panel observed that although the involvement of senior management in introducing changes to the safety culture was vital, it may now be time to further devolve operational implementation of, and responsibility for, safety to line managers. This would allow the role of senior management to become more strategic while still demonstrating their commitment to safety. SCART guidelines say the characteristics of a safety culture include 'Management delegates responsibility with appropriate authority to enable clear accountabilities to be established' and 'Ownership for safety is evident at all organisational levels and for all individuals.'[20] There is a fine balance in management's operational safety role and their strategic role in building a safety culture where both are important.

The penetration of the safety culture throughout ANSTO Health appears uneven. It seems that staff who are actively involved in the continuous improvement process and the radiation safety improvement team have a greater commitment to and belief in management's commitment to an improved safety culture. This was evident in the conversations the panel had with staff members across a range of work levels.

There was also some concern raised that managers do not necessarily have a good grasp of production processes and would benefit from a more "hands-on" approach to improve their understanding of health and safety concerns raised by production technicians.

Another avenue to help build the safety culture at ANSTO is to consider elevating the oversight role of the current OH&S committee to become a stronger part of the risk management framework. This will allow the committee to be better involved with dealing with reports and to better engage staff at all levels. This strategy should also assist in improving communication across the organisation.

ANSTO Health recognises the difficulties in embracing safety culture but believes that they have made a good start, although there is still a way to go. The proactive approach of management to improve health and safety is evidenced by ANSTO initiating the forthcoming review by MPR to investigate the radiological and general safety of ANSTO Health. This private consultant's

[16] ANSTO 2010-2015 Corporate Plan p7
[17] ARPANSA letter, p2
[18] Comcare Employer brief for ANSTO, March 2011
[19] IAEA: SCART Guidelines, Services Series 16, Vienna, 2008, p25
[20] SCART Guidelines, p 26

report should be made available to the OH&S committee and discussed with management, staff, ARPANSA and Comcare.

Recommendation 1
The panel recommends, as a means of further embedding the safety culture at ANSTO Health, that senior executives devolve some further operational implementation and responsibility for safety to line managers. While still maintaining some operational safety presence, the role of senior management would then be to examine any trends and take a more strategic oversighting role.

Recommendation 2
The panel recommends ANSTO Health consider the value of introducing a program where management would spend some time working alongside experienced technicians to improve their practical understanding of production processes and the safety concerns raised by production technicians. The panel considers greater visibility and practical involvement of senior management would demonstrate a 'walk the talk' approach as well as an openness in staff communication.

Systems are in place to manage the radiological safety of ANSTO Health workers.

The panel did not find evidence of a systemic failure to manage the risk of radiological exposure at ANSTO Health. Staff and management agreed in their conversations with the panel that there have been substantial safety improvements over the past two years.

This point of view was supported more formally by a range of reports submitted to the panel. Board papers sighted by the panel show that the average effective dose for ANSTO Heath personnel for 2010 to mid-December was 1.97mSv against an ANSTO Annual Constraint effective dose of 15mSv. The November/December dosimetry results identified **nil** ANSTO Health operators with individual radiation doses in excess of ANSTO's monthly investigation levels. The (ANSTO wide) dosimetry[21] report to ARPANSA says "A review of the exposure data [...] demonstrates that, for the calendar year 2010, no staff have exceeded either a regulatory limit (for effective or equivalent dose) or ANSTO's dose constraint for effective dose.'[22] The dosimetry report also provides comparison between Q4 2010 to Q3 2010 and Q4 in 2009 which shows a downward trend in average dose for ANSTO Health employees from 0.62mSv to 0.54 mSv, well below the annual effective dose rate of 20mSv averaged over five consecutive years and the annual effective dose rate which shall not exceed 50mSv in any single year. To put this in perspective, the effective radiation dose of a barium meal is 2.5mSv, and that of a mammogram is 0.4 mSv[23].

The panel spoke to ARPANSA who provided a positive verbal report about significant improvements in safety at ANSTO Health over the past two years. ARPANSA followed up with a written response which was based on ARPANSA inspections of ANSTO on 1 and 18 March 2011. The written report noted 11 safety initiatives described by ARPANSA as recent safety improvements.

The strengthening of ANSTO Health's protections against radiological exposure has been brought about by a number of measures:

- ANSTO Health has in place significantly lower working level radiation limits than required by regulation; and
- ANSTO Health has the expectation that all incidents and near misses will be reported internally and all radiological incidents will be reported to ARPANSA.

[21] Dosimetry is the accurate measurement of doses, especially of radiation (Dictionary.com)
[22] Dosimetry Statistical Report for ANSTO Staff Members (October – December 2010)
[23] http://apo.ansto.gov.au/dspace/bitstream/10238/2115/1/Ionising_Radiation.pdf, p6, accessed 26 May 2011.

The purpose of lowering working radiation limits and implementing a reporting requirement of all radiological incidents and near misses is to provide additional data for trend analysis which in turn can contribute to continuous improvement of processes and procedures. Senior management describes the trend analysis as an active strategy in the continuous improvement process.

Regular training and communication ensure that staff are aware of dosage limits although there is a tension between production and safety requirements. The panel heard anecdotal comments that historically some staff were prepared to risk exposure, though not above safe regulatory limits, to ensure production schedules are maintained. Management has the responsibility to ensure staff safety. Part of the current transition at ANSTO Health is that safety is being emphasised as the highest priority.

It was reported to the panel that more incidents of radiological exposure appeared to occur in the QC laboratory. ANSTO Health is aware of this and has put strategies in place to try to lower the number of incidents. Strategies include abandoning the radiological threshold to build data collection for increased trend analysis to help identify the cause of events. ARPANSA noted that planning for the automation of some processes in the QC laboratory was designed to reduce the handling of radioactive materials.

The panel is satisfied that systems are in place to provide for the radiological safety of ANSTO Health workers.

Recommendation 3
The panel recommends ANSTO Health continue to explore the reasons why incidents of radiological exposure are higher in the QC laboratory and implement changes to practices, layout or equipment to lower exposure levels in the QC laboratory.

Penetration of the "no-blame" culture through the facility

The 'no blame' culture was highlighted as being of key importance by senior management of ANSTO and ARPANSA. Their remarks echo the international commentary about trust and a 'no blame' culture that can be found in the SCART Guidelines, even if there is no formally accepted definition of the 'no blame' culture. In the nuclear industry, a 'no blame' culture creates the environment where it is possible to rapidly act upon any radiological incident because there is easy and rapid access to information unclouded by personal recriminations.

A vibrant safety culture is underpinned by a 'no blame' culture. Senior management appear to have a genuine commitment to a 'no blame' culture and this is apparent in the training and process documents. The *Event Investigation Guide*[24] quite clearly states that 'the purpose of investigating events is not to apportion blame.'(p1) and 'remember, systems, not people, are often the basic cause of many incidents' (p3). However there was a question from some staff as to how well the 'no blame' culture was applied. The tension lies in identifying the difference between well founded and less substantial internal or external complaints. It is a fine line to walk. A belief at all levels in 'no blame' is the only way to progress a dynamic safety culture. Continuous communication underpins the 'no blame' culture.

The constitution of the OH&S Committee outlines what is meant by the 'no blame' workplace for ANSTO Health[25] and includes principles such as:

- 'Everyone is committed to working in a No blame culture';

[24] ANSTO OHSE Guide: OHSE Management – Event Reporting: Event Investigation
[25] Occupational Health and Safety Committee Constitution for ANSTO Health Occupational Health and Safety Committee, hard copy given to the panel at the site visit on 12 April 2011, p2,3

- 'Our reporting motivator is Care not Compliance';
- 'Openness and honesty for the investigation of events is important for the root cause to be identified and addressed. There will be no action taken against individuals arising from an event investigation';
- 'Where actions of individuals are proven as malicious these will be acted upon'; and
- 'Results of investigations and lessons learnt will be communicated to all staff without the use of names of individuals.'

There is a good understanding of the 'no-blame' culture by senior management and those managers and staff who interact with senior management regularly. This was apparent in the remarks of ANSTO Health people who talked to the panel and remarks from ARPANSA. During the 1st and 18th March 2011 inspections, 'ARPANSA Inspectors were told by ANSTO staff members that they could raise any safety related issues with their supervisors and/or Health and Safety Representative.'[26]

Aspects of the 'no blame' culture have been successfully implemented. The 'no-blame' culture has been achieved in that staff feel they have the authority to stop production on account of a safety issue. The STAR principle, *Stop, Think, Act and Review*, was raised by line managers and some staff as a useful and increasingly common practice. It was viewed as evidence that management was serious about safety being a higher priority than production schedules.

It appears that a 'no-blame' culture has been significantly achieved in the internal reporting of incidents, particularly by those actively involved in the continuous improvement process. These people see incident reporting as a way of improving health and safety through identifying trends that aid in process improvement and identification of training needs. There is a significant increase in incident reporting internally and to ARPANSA.[27]

An impediment to the penetration of the 'no-blame' culture includes an apparent sensitivity by management to staff reporting incidents externally without using the current internal processes. This perception needs to be balanced with the need of ANSTO Health management to be aware of the true nature of the incident or the complaint so that they can have the opportunity to investigate before third parties become involved.

Some staff felt that management actions do not always support the rhetoric of a 'no-blame' culture. The *Event Investigation Guide*[28] requires that the names of everyone involved in an incident are recorded as part of the formal investigation. Some of those interviewed in the course of the review felt that being named was the first step in apportioning blame. It is important that ANSTO demonstrates over time that there are no negative consequences for employees who report safety problems, whether or not those reports are subsequently verified.

It was also apparent from some staff comments that slowness of feedback following a radiological incident or suspension of work colleagues led to suspicion and a lack of faith in a 'no blame' culture. ANSTO is trying to address this concern as shown in the specified time frames laid out in the Event Response Matrix.[29] However, although the document sets timeframes to complete investigations of different levels of incidents, it does not specify a time frame for reporting back to staff.

Staff actively supported the continuous improvement process and saw it as empowering. However the panel noted that feedback from this process was not sufficiently effective, in spite of the charts and written information that were available.

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[26] ARPANSA letter p1
[27] ARPANSA letter p2
[28] Event Investigation Guide p2
[29] OHSE Management – Event reporting, Event Response Matrix, Approved by Manager OHSS on 4/3/11

There is a need to continue to actively engage with staff to reinforce the 'no blame' message. Disengagement with staff will slow down the process of achieving a uniform acceptance of the 'no blame' culture across ANSTO Health. Some staff reported disappointment in a perceived slowing down of the continuous improvement process. The 'no blame' culture has not been fully integrated into ANSTO Health at this time.

The continuous improvement program has been discussed in more detail in Chapter 3. Continuous improvement is integral to establishing 'no blame'. The greater the involvement of people in the continuous improvement process, the greater their willingness to trust management and to have belief in a 'no blame' culture.

Recommendation 4
The panel endorses ANSTO Health's commitment to the continuous improvement process and recommends that ANSTO Health ensures the committees contributing to the continuous improvement process continue to meet and take action so that continuous improvement is embedded in all processes at ANSTO Health, including an active role for the ANSTO Health OH&S Committee.

Recommendation 5
The panel recommends that ANSTO Health introduces a greater variety of feedback mechanisms to enhance staff's willingness to accept their role in the effectiveness of the continuous improvement process.

Recommendation 6
The panel recommends management's commitment to a 'no blame' culture is reinforced by timely feedback. The feedback should be provided specifically to impacted staff members and then to all ANSTO Health employees on all incidents and broader safety concerns.

Repetitive strain injury (RSI)

The trend over the past two years is that RSI injuries have fallen significantly, particularly since the introduction of the Peak Health Program. The ANSTO OHSE Management System Overview[30] provided to the panel shows that ANSTO's performance against national 2012 targets set by Comcare is well within the Comcare requirements and shows a downwards trend.

The Comcare profile of ANSTO /ANSTO Health[31] shows that the total number of accepted claims per financial year 2006-07 to 2010-11 has fallen from seven to two for ANSTO Health. Over the same period, 70 per cent of claims for ANSTO Health have been for body stressing, although only 10 per cent of lost time has been because of body stressing incidents.[32]

'Body stressing' covers a range of injuries including repetitive strain injury. It has not been possible to separate out Comcare statistics for ANSTO Health RSI. Staff reported major concerns with RSI to the panel. The panel observed that technicians are required to work with equipment that may benefit from design improvements. Some technicians appeared to be working in awkward physical positions brought about by the shape of the equipment. The panel observed that some technicians chose not to use some injury prevention equipment which has been provided because it intruded upon their ability to carry out the task. For example, a tall technician chose not to stand on the rubber mat designed to relieve foot and leg tiredness because the height of the observation window was low and standing on the mat would have caused him to stoop further to use the window.

[30] ANSTO *OHSE Management System Overview*, preliminary information sent to panel 31 March 2011, p 4,5
[31] *Comcare ANSTO Profile* March 2011, p 6
[32] Ibid p 5

It is clear that some modifications of equipment have been made to alleviate physical strain, for example the release mechanism on the manipulators has alleviated some hand stressing. More modifications appear necessary to relieve pressure on other parts of the body, for example, shoulders and wrists.

The continuous improvement process is focusing on overcoming the causes of RSI. The B23 Intermediate Safety Upgrade Project[33] list focuses on many actions that fall in the RSI, body posture, body stressing, ergonomic, lifting and related categories. The Safety Upgrade Project collated 80-plus tasks/actions, identified by employees and the OHSE committee to improve safety at ANSTO Health. Large numbers of these actions have been completed, although a reasonable number of relevant actions remain in progress or in very early stages. Nevertheless oral evidence suggests there is still a challenge for ANSTO Health in regard to the occurrence of RSI.

ANSTO management has actively addressed the incidence of physical strain through the introduction of the Peak Health Program. The Peak Health Program is made up of exercise and case management. It is reviewed monthly. ANSTO says 'Exercises are designed to target the range of movements that are required when using the manipulators. Results from Comcare CIS data show that financial cost of body stressing injuries has reduced from $339 in the three years prior to Peak Health to $136 post the introduction. More importantly than the dollars, the number of claims has reduced by 43% in the same period. Peak Health continues to be an important program in ANSTO Health.'[34]

The panel observed the Peak Health Program appears to have reduced RSI injuries where core strength of operators is a factor, but appears to have had less success in overcoming the full range of RSI injuries, including those caused by aging equipment and design flaws in equipment.

Operators report that although Peak Health is useful it is sometimes portrayed as a cure-all. Some staff commented that they would like to see a broader range of strategies put in place to counter the full range of repetitive strain injuries.

Recommendation 7
The panel acknowledges the Peak Health Program has had major benefits in decreasing RSI injuries. However, the panel recommends ANSTO Health consider a wider range of strategies to address RSI occurring at ANSTO Health including engaging external assessments by occupational health and safety experts.

Recommendation 8
The panel recommends ANSTO Health continue to focus on the safety upgrade continuous improvement project and, where possible, equipment redesign and replacement.

Capital and Infrastructure

ANSTO Health operates in a building that was constructed as a laboratory, but has been upgraded and fitted with equipment for production.

The panel considered that the facility's floor plans are not ideal for workflow for the current production levels. As ARPANSA points out 'The ANSTO Health facilities were constructed on the basis of 1960s and 1970s technology and were done so according to the standards available at the time of construction. Since that time, the facilities have undergone a series of upgrades.' ARPANSA also says 'Improvements made to the facilities since ARPANSA's inception,

[33] ANSTO Health Intermediate Safety Upgrade Project for B23, 28 April 11, sent to panel 3 May 2011
[34] *The Current Context of ANSTO Health,* Safety, *continuous improvement and associated cultural change over the last two years*, prepared for: Ministerial Review of ANSTO Health by: ANSTO Executive, 21 April 2011, p 8

including several changes having significant implications for safety, have been assessed for compliance with the most current standard available at the time.'[35] Nevertheless, the nature of the equipment and floor design may have potential for safety incidents if production levels are increased.

Some plans are in place to improve capital and workflow. For example, the Gentech washing and waste handling capital project is at detailed design stage at an expected final cost of $5million.[36] This initiative will result in an improved workflow in the production facility, reducing unnecessary movement of heavy generators in the work area. The development was a direct result of the Safety Upgrade Project.

If ANSTO Health is to meet Australian and regional demand for radioisotopes in the future, greater emphasis will have to be placed on how the facility can handle changing production levels. A strategic approach to upgrading the facility should focus on developing a short, medium and long-term outlook for ANSTO Health infrastructure.

There does not appear to be any capacity in the number of hot cells to maintain production during equipment breakdown. This may result in an increased risk of RSI if staff work longer or additional shifts to increase production. Undertaking maintenance without providing sufficient time for equipment to "cool down" is also more time consuming as employees must take the precaution of dressing in protective clothing. This in turn, results in a further slowing in the production schedule.

The panel talked to a number of staff who commented that they did not know why a previously proposed new facility did not proceed. These comments reinforce the panel's earlier concern that communication flows between ANSTO Health management and general staff are interrupted.

Recommendation 9
The panel acknowledges the work that ANSTO and ANSTO Health have already undertaken towards automating processes and redesigning the workflow of the facility. However the panel recommends ANSTO considers the benefits of purchasing additional capacity to provide a fallback when equipment breaks down at ANSTO Health.

Maintenance

A number of comments were made to the panel about maintenance. Management has a maintenance plan which they claim is on track, though feedback from staff is not consistent with this claim. The panel observed a breakdown of equipment on the day of the site visit. Oral evidence suggests breakdowns of equipment are common across ANSTO Health. The ANSTO Health consolidated results of the March 2010[37] staff survey using a traffic light system for quick interpretation of results show red traffic lights for all of the questions relating to facilities and for two of the technology statements: 'The technology used in ANSTO is kept up to date' and 'ANSTO makes good use of technology'[38]. Staff argue that although maintenance for the most urgent matters is undertaken, there is not sufficient capacity for more long term and strategic maintenance work to be done.

Management has set aside approximately $1million for a preventative and active maintenance program[39] which was initiated in Q3 of 2010. This initiative was started after the staff survey,

[35] ARPANSA letter p 4, 5
[36] *The Current Context of ANSTO Health*, 21 April, p5
[37] It should be noted that the continuous improvement process and other changes in the year since the survey may mean that the staff survey results may have been different at the time of the panel investigation.
[38] *Voice Project Survey Report* © Voice Project Pty Ltd ANSTO Health, completed march 2010, p 4,5
[39] *ANSTO Health Automation Update*, sent to panel 19 April 2011, p3.

but staff talking to the panel still did not seem fully aware of the preventative and active maintenance program. The lack of awareness reinforced another red light from the staff survey in response to the statement 'Senior management keep people informed about what is going on.'[40]

The panel noted that it is difficult to sustain maintenance staff levels in ANSTO Health because of the shortage of suitably qualified and skilled people. There is only one nuclear facility in Australia, so ANSTO may have to further develop a significant training program as part of their recruitment strategy. Appropriate training for maintenance staff in a nuclear facility was reported to take up to two years. ARPANSA comments that 'retention and acquiring personnel with nuclear skills' is a challenge faced by ANSTO Health in complying with the ARPANS legislation.[41] Not withstanding the challenges of sustaining maintenance staff levels, ANSTO needs to address how best to build this capability.

Recommendation 10
The panel recommends that ANSTO upgrades maintenance services to the radiopharmaceutical production facility.

Recommendation 11
The panel recommends that maintenance planning and action become part of strategic focus on upgrading the facility, focusing on developing a short, medium and long-term outlook for the facility maintenance strategy that incorporates recruitment and training of adequate staff for ANSTO Health's maintenance capability requirements.

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Recommendation 12
The panel recommends that ANSTO Health develops a proactive plan in relation to maintenance staff recruitment and training in the short, medium and long term and report on this plan to the Board at regular intervals.

Safety and reporting

The panel noted the increased levels of reporting in ANSTO Health. This has come about from the policy decision that all incidents and near hits are reported.[42] The *OHSE Management – Event Reporting Event Investigations* says 'All work related accidents, injuries, illnesses, dangerous occurrences and near misses need to be investigated and a report provided.'[43] As mentioned earlier, it was noted that increased reporting does not necessarily reflect an increase in incidents but rather greater attention to safety and a lowering of radiation level required reporting. ARPANSA acknowledges that the increase in reporting is indicative of improvement in safety culture rather than an increase in the number of radiological incidents. It is continuing to monitor the situation.[44]

ANSTO is also applying a lower threshold interpretation for regulatory notifications to Comcare as described in Board papers sighted by the panel. ANSTO recognises that this may lead to an increase in notifications to Comcare but sees value in the increased data that will be collected.

The electronic event reporting process has led to greater ease of analysis of information raised in the reports and ability to feed this information into the continuous improvement process. It has also provided improved feedback possibilities, although oral evidence suggested that the

[40] *Voice Project Survey Report*, p6
[41] ARPANSA letter p5
[42] ARPANSA letter p2
[43] OHSE Management – *Event Reporting Event Investigations Guide*, p1
[44] ARPANSA letter p2

feedback loop could be improved. ANSTO should ensure that electronic event reporting is provided to all ANSTO Health staff and there is an automatic follow-up mechanism.

The need for improved feedback and communication between senior and general staff relating to incidents was a theme that became apparent throughout the panel's investigation.

The panel noted the encouragement from senior management to increase reporting levels and see this as a step in the right direction. The panel would like to see a further opening up of the approach to reporting with the recognition that many incidents will be insignificant or minor in nature. A more open approach to reporting would also encourage reporting to the regulatory bodies from ANSTO Health and individuals if they feel that internal processes do not address their concerns appropriately and in a timely manner. Increased openness would be a further signal to staff of senior commitment to the 'no blame' culture which may have a cascading effect at all levels of ANSTO Health.

The panel concluded the inaccurate public reporting of the seriousness of radiological incidents undermines ANSTO's reputation and the important role it plays in providing radiopharmaceuticals to the public. The negative publicity also generates stress among staff members who are concerned with delivering radiopharmaceuticals to clients.

Recommendation 13
The panel supports a more structured reporting system comprising three components:

- Incident reporting should be actively encouraged;
- The context of the incident report, report investigation and feedback to management and staff on the outcome should be provided in a timely manner; and
- Reports would clearly identify (a) performance against accepted ANSTO benchmarks and (b) where there had been a breach of regulatory limits/legislation.

The panel acknowledges the first component of this system is becoming established at ANSTO Health. However, the panel considers the process of providing feedback to relevant staff and management could be improved and the implementation of the third component would assist in making reporting more meaningful and useful in the continuous improvement context.

Recommendation 14
The panel considers there is a case for ANSTO to increase its education of the general public about radiological exposure.

Regulatory framework and reporting

The panel noted that ANSTO has in place OHSE policies and procedures that provide for compliance with OHS and ARPANS legislation. During the 2011-12 financial year, ARPANSA will undertake a review of all ANSTO licences as part of updating and providing uniformity for licences across ANSTO.[45]

ARPANSA and Comcare appear to have different, but at times corresponding, responsibilities in terms of radiological safety. The panel understands ARPANSA is positively disposed towards negotiating an agreement with Comcare that provides clear delineation of responsibilities.[46] In 2011 drafting of an MOU between the two organisations is ongoing with both organisations currently providing comment on the draft. The MOU is expected to outline the areas where both organisations will work together and establish protocols and processes for the relationship.

[45] ARPANSA letter p5
[46] Panel discussion with ARPANSA, 12 April 2011

The panel endorses a closer relationship between ARPANSA and Comcare to ensure a consistent message in relation to radiological safety for ANSTO. In the short term, ARPANSA may like to consider providing training in the complex area of radiological safety to Comcare officers who work with ANSTO.

ARPANSA and ANSTO have regulatory requirements governing release of information. All radiological incidents reported to ARPANSA which breach the Act or licence conditions are tabled in Parliament. The panel believes that the interpretation of this information could be better contextualised by including supporting documentation which categorises the levels of risk. Such a document would allow clearer understanding of the degree of risk for individuals. It would also assist in educating the general public on radiation safety.

ARPANSA is currently examining relevant legislation and regulations with a view to providing a more proportionate response to incidents that do not comply with the Act or licencing conditions.

The panel encourages the continuation of open and transparent reporting of all incidents within ANSTO Health and to ARPANSA to encourage full transparency and greater opportunity for analysis of safety practices.

ARPANSA is focussing on building a collaborative approach to resolving non-compliance. An approach which examines even minor incidents can help discover patterns of behaviour and can lead to greater radiological safety.

Recommendation 15
The panel encourages the development of a formal agreement between Comcare and ARPANSA that clarifies organisational responsibilities for investigating and evaluating radiological incidents at ANSTO.

Recommendation 16
The panel encourages ARPANSA to continue examining relevant legislation and regulations with a view to providing a more proportionate response to incidents that do not comply with the Act or licencing conditions. For all reports tabled in parliament, the panel encourages the inclusion of supporting documentation which provides commentary about the risk profile. The panel considers the inclusion of supporting documentation that provides commentary would assist in educating the general public on radiation safety.

Recommendation 17
The panel encourages ARPANSA to continue to build a collaborative relationship with ANSTO Health to encourage disclosure of all incidents so as to reinforce the continuous improvement program at ANSTO Health.

Audit and Risk Committee

The panel recognised that satisfactory governance arrangements are in place through the Audit and Risk Committee. The panel feels that arrangements would be further strengthened by recommended changes to the constitution of the committee and the timing of the committee meetings.

The panel appreciated the interaction with Chairman of the Board and the Chair of the Audit and Risk Committee. The panel reviewed a number of documents that are provided to the Board and cover the scope of OH&S within ANSTO Health.

The Audit and Risk Committee is the subcommittee of the Board responsible for health and safety at ANSTO. The Audit and Risk Committee, chaired by Ms Christine McLoughlin comprises all members of the Board, with the exception of the Board Chair who attends as an

observer, and an independent member. The Audit and Risk Committee meets before every second Board meeting, with Board meetings being held every two months.

The panel observed that the charter[47] of the Audit and Risk Committee is very broad and heavily focussed on financial matters.

The panel also observed that the size and composition of the Audit and Risk Committee militates against it separating itself sufficiently from the Board. The panel felt that a smaller subcommittee that met at regular, independent times from the Board, with regular reporting to the Board would be more targeted.

Directors with specific expertise in audit and risk or other relevant areas could be asked to attend the separate subcommittee as required.

Separation of Audit and Risk subcommittee meetings from regular Board meetings provides benefits for both the Audit and Risk subcommittee and the Board itself. The greater separation will allow the Board to focus more clearly on the strategic direction of ANSTO.

Recommendation 18
The panel recommends

- The membership of the Audit and Risk subcommittee should be reduced;
- Greater emphasis should be placed on risk by this committee;
- Directors with relevant specific expertise are invited to attend as required;
- Meeting times are separated from Board meetings to allow a greater separation of duties; and
- Audit and risk reports continue to be part of the agenda for every Board meeting.

[47] Audit and Risk Committee Charter, approved by ANSTO Board 29 November 2007, printed 14 April 2011

Conclusion

ANSTO is undertaking a transformational change in its approach to safety based on an active and well promoted continuous improvement process that was put in place by the CEO, Dr Adi Paterson on his appointment to ANSTO in 2009.

ANSTO Health has the weighty responsibility to produce approximately two million doses of radioisotopes for diagnostic and treatment purposes for the Australian community, supporting 85 per cent of the nuclear diagnostic procedures carried out in Australia each year. ANSTO Health also sells some radioisotopes to our near neighbours in New Zealand and countries in South East Asia.

Therein lies the challenge. ANSTO Health workers take great pride in meeting the medical needs of many Australians and near neighbours, but must ensure that they do not compromise their own safety to carry out the task. Management must retain responsibility for safety at ANSTO Health and as such is articulating and leading the way in giving safety the highest priority. The organisation is moving along the pathway of creating a strong safety culture at ANSTO Health.

The panel was satisfied that ANSTO Health has in place the structures and policies to meet the legislative requirements for safety in the workplace.

The panel, however, found that ANSTO Health has challenges in meeting its safety aspirations brought about by historical, physical, governance and communication aspects of ANSTO Health. The use of existing facilities, the commercial requirements of the business and the nature of the product put particular pressure on ANSTO Health.

Although there are strong governance arrangements in place, a refinement of the Audit and Risk subcommittee may lead to a more focused safety analysis. Within the organisation increased levels of communication have led to the start of an effective continuous improvement process, a greater analysis of how to prevent safety hazards and the beginning of establishing a 'no blame' culture'. Although there is agreement that a good start has been made, there is still some way to go. Wide ranging, timely and open communication between senior management and staff is necessary to underpin all developments.

The panel has made 18 recommendations that address the issues described in this report.

Review of Health and Safety at ANSTO Health
Terms of Reference
22 March 2011

1. The purpose of the review is to undertake an independent review of the current state of health and safety arrangements at ANSTO Health. The review is to:

   a) Review the policies and procedures ANSTO has in place to ensure its compliance with the Australian Radiation Protection and Nuclear Safety Agency's (ARPANSA) licence and the Australian Radiation Protection and Nuclear Safety legislation;
   b) Review the current arrangements for compliance with the *Occupational Health and Safety Act 1991*;
   c) Examine the role and obligations of relevant line managers, senior management and directors to ensure the health and safety of ANSTO Health employees; and
   d) As appropriate, recommend improvements to health and safety arrangements at ANSTO Health.

2. For contextual purposes, the review panel will draw on information as appropriate from ANSTO and relevant regulatory bodies, such as ARPANSA and Comcare, on ANSTO Health's compliance with relevant legislation and licenses.

3. The review is to be undertaken by an independent, expert panel established by the Minister for Innovation, Industry, Science and Research.

4. The independent panel is to provide a final report to the Minister for Innovation, Industry, Science and Research by 31 May 2011.

Biographies – Review of ANSTO Health

Mr Mark Paterson AO
Mr Paterson has been the Secretary of the Department of Innovation, Industry, Science and Research since its creation in 2007 and was the Secretary for the former Department of Industry, Tourism and Resources from 2002. Mr Paterson sits on the Education Investment Fund Board and the CSIRO Board.

Mr Paterson was the Chief Executive of the Australian Chamber of Commerce and Industry and has experience with the Retailers Council of Australia, the Retail Traders Association of NSW, the Australian Chamber of Manufactures, and the Australian Medical Association. He is a Fellow of the Australian Institute of Company Directors, the Australian Institute of Management and the Retail Management Institute of Australia.
He holds a Bachelor of Business from the South Australian Institute of Technology and was appointed as an Officer of the Order of Australia in 2007 for service to business and industry through policy development and economic research.

Dr Jim Peacock AC
Dr Jim Peacock (AC, FAA, FRS, FTSE, FAIAST) is a Fellow in CSIRO. Dr Peacock was Australia's Chief Scientist from March 2006-August 2008. Dr Peacock is an outstanding scientist with a record of academic excellence and is highly respected by the science, technology and agribusiness communities.

Dr Peacock is an award winning molecular biologist and fervent science advocate. He is recognised internationally as an eminent researcher in the field of plant molecular biology and its applications in agriculture.

In 1994, he was made a Companion of the Order of Australia for outstanding service to science, particularly in the field of molecular biology and to science education. Dr Peacock is a Fellow of the Australian Academy of Science (President from 2002-2006), Fellow of The Royal Society of London, the Australian Academy of Technological Sciences and Engineering, a Foreign Associate of the US National Academy of Sciences and a Foreign Fellow of the Indian National Science Academy.

Dr Peacock is a strong advocate for the integration of science and global business. He is an expert in using molecular biology, and particularly the latest genomic technologies, to improve the qualities of the major foods that we produce from cereal and legume crops.
Dr Peacock drives innovative communication efforts to inform the general public as to the outcomes and value of modern science. He has brought the values of modern science to a broad cross-section of the community.

Mr Grahame Cook PSM
Grahame Cook (PSM, GAICD, FAIM, BEc) is a Director of the Allen Consulting Group. Grahame has extensive knowledge of public sector policy and programs, including education, science, research and innovation; industry policy; environment and natural resource management; and micro-economic reform.

Prior to joining the Allen Consulting Group Grahame managed his own consulting company. Previously he had a successful career in the Australian Public Service, including as a Deputy Secretary in the Department of Education, Employment and Workplace Relations. He held senior positions in the Department of Education, Science and Training, Prime Minister and Cabinet; Industry Tourism and Resources and Environment and Heritage.

Grahame served on the Board of ANSTO, the PDF Board and on various government committees including the CRC Committee, the Prime Minister's Science Prizes Committee; the Coordinating Committee for Science and Technology, the Major National Research Facilities Advisory Committee and the Oceans Policy Scientific Advisory Committee. He represented Australia on a number of delegations, including the OECD Global Science Forum and the Kyoto Climate Change Convention.

Mr Tim Ayres
Tim Ayres is NSW Secretary of the Australian Manufacturing Workers' Union.

In 15 years with the AMWU, Tim has taken a leadership role in representing the interests of members in the aerospace, defence and engineering industries. He has also worked extensively with government and private sector stakeholders to promote investment and innovation in manufacturing, particularly in the clean technology sector.

Tim is a director on the boards of several major industry superannuation and redundancy funds; and was recently appointed by the NSW Government as Chair of the Low Carbon Future for the NSW Hunter Valley Taskforce – an initiative to chart a successful transition for the region's emissions-intensive industries to a carbon-restricted economy. Tim is a graduate of the University of Sydney in Industrial Relations.

ANSTO Health Review
Visit to ANSTO Health by Review Panel
Agenda
11 - 12 April 2011

Day 1 – Monday, 11 April 2011

Time		Agenda item		Lead
9.00	9.30	1	Purpose of the Review: • Introduce panel members; • Emphasise the purpose of the review is on current arrangements; and • Provide an overview of the Terms of Reference.	Mark Paterson, Chair of Review Panel
9.30	9.32	2	Welcome and introductions by Dr Paterson, Chief Executive Officer of ANSTO.	Dr Adi Paterson, Chief Executive Officer
9.32	10.02	3	Overview of the role and responsibilities of the ANSTO Board in ensuring the health and safety of ANSTO Health workers, including frequency and nature of reports on OHS to the Board and its committees.	Professor Paul Greenfield AO, Chairman of ANSTO Board
10.02	10.30	4	• Overview of ANSTO and ANSTO Health; • Approach to occupational health and safety at ANSTO and ANSTO Health, including ensuring improvement in practices resulting from, among other initiatives, internal and external reviews; • Role and responsibility of senior and line managers in ensuring the OHS of ANSTO workers; • Conditions of ARPANSA Licences applicable to ANSTO Health; and • CEO engagement with ARPANSA and CEO initiated processes in this regard.	Dr Adi Paterson, Chief Executive Officer
10.30	10.45		Morning tea break	

Time		Agenda item		Lead
10.45	11.30	5	Overview of ANSTO Health, including. • Radiopharmaceuticals produced at ANSTO Health and their uses; • Current OHS policies and procedures in place at ANSTO Health; • Mechanisms to ensure continuous improvement to practice; • Compliance with regulatory requirements (ARPANSA and the TGA); and • Compliance training for ANSTO Health staff.	Mr Shaun Jenkinson, General Manager, ANSTO Health
11.30	12.15	6	Radiological assurance across ANSTO, including • how radiation measurements are made; • how the personal radiation records are prepared and maintained; • how these records are translated into reporting to ARPANSA; • how the internal investigatory limits are set and the reviews that are undertaken to ensure that radiation doses are As Low As Reasonably Achievable.	Mr Hefin Griffiths, Manager, Safety, Environmental and Radiological Assurance
12.15	1.00		Lunch break	
1.00	3.00	7	Tour of ANSTO Health.	Mr Shaun Jenkinson, General Manager, ANSTO Health
3.00	3.15		Afternoon tea break	
3.15	4.15	8	Further consultation with ANSTO Board and senior management, including Professor Paul Greenfield and Ms Christine McLoughlin (Board), Dr Adi Paterson, Mr Shaun Jenkinson and Mr Hefin Griffiths.	ANSTO Board and senior management
4.15	5.00	9	Wrap up, including identification of any additional interviews for Day 2, material to be requested from ANSTO and any follow-up questions for Day 2.	*Closed session* ANSTO Health review panel only
5.00	5.30	10	Discussion with Dr Paterson, Mr Jenkinson and Mr Griffiths regarding first day of site visit, follow-up on outstanding queries and formal request for any additional information.	ANSTO Health review panel

Day 2 – Tuesday, 12 April 2011

Time		Agenda item		Lead
9.00	10.30	1	Meet with ARPANSA.	ANSTO Health review panel
10.30	11.00		Travel to ANSTO and morning tea break	
11.00	1.00	2	Consultation with senior and line managers including: • Compliance & Quality Manager and Quality Control Supervisor; Sarah Ballantyne; • Regulatory Affairs Manager; Aman Sharma; • Health and Safety Representative; Richard Reason (Deputy HSR) ; • Safety Manager (includes Training); Karen Wolfe; • Radiation Protection Advisor; Robin Foy; • Operations Manager; Carlos Charlin; • Production Manager; Enzo Valente; and • Supervisors & technicians who produce radiopharmaceuticals; Ramez Helou, Flyn Mckinnrey, Peter Kroek	ANSTO Health review panel
1.00	1.30		Lunch break	
1.30	3.00	3	Invitation for ANSTO Health staff to speak with review panel on a 1 to 1 or small group basis (15 minutes per conversation).	ANSTO Health review panel
3.00	3.30	4	Wrap up, including preliminary discussion regarding key recommendations arising from the review.	*Closed session* ANSTO Health review panel only
3.30	4.00	5	Discussion with Dr Paterson on next steps for the review panel and to thank ANSTO for assistance with review.	Mark Paterson

ANSTO and ANSTO Health people who met with the panel

At the panel's request

Dr Adi Paterson, Chief Executive Officer

Professor Paul Greenfield AO, Chairman of ANSTO Board

Ms Christine McLoughlin, Chair of the Audit and Risk Committee

Mr Shaun Jenkinson, General Manager, ANSTO Health

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

Sarah Ballantyne, Compliance & Quality Manager and Quality Control Supervisor

Mr Aman Sharma, Regulatory Affairs Manager

Mr Richard Reason, Deputy Health and Safety Representative

Ms Karen Wolfe, Safety Manager (includes Training)

Mr Robin Foy Radiation Protection Advisor

Mr Carlos Charlin, Operations Manager

Mr Enzo Valente, Production Manager

Mr Ramez Helou, Mr Peter Kroek and Mr Jackson Franciskovic, Supervisors & technicians who produce radiopharmaceuticals

People who responded to panel's invitation to speak with them

Mr John Bourke

Mr James Hopkins

Mr Garry Scott

Ms Karen Thornton

Ms Tricia Eastcott

Mr Mark Richards

Ms Janelle Duckett

Ms Marion Parkinson

Mr David Reid