Senate Standing Committee on Foreign Affairs, Defence and Trade

Opportunities for Advancing Australia's Strategic Interests through Existing Regional Architecture

ANSTO

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1. Introduction

As the custodian of Australia's nuclear science, technology and engineering capabilities, the Australian Nuclear Science and Technology Organisation (ANSTO) is pleased to make this submission to the Senate Standing Committee on Foreign Affairs, Defence and Trade inquiry into *Opportunities for Advancing Australia's Strategic Interests through Existing Regional Architecture*.

ANSTO operates a large proportion of Australia's landmark research infrastructure, including the OPAL multipurpose research reactor, the Australian Synchrotron, the Australian Centre for Neutron Scattering, the Centre for Accelerator Science and the National Deuteration Facility. This infrastructure places Australia at the forefront of research and innovation for the benefit of public health, industry and the environment, and is used by researchers and industry from around Australia and internationally. We undertake research and development in relation to the production and use of nuclear medicines that are used in the diagnosis and treatment of many medical conditions, and to encourage and facilitate their application and use. ANSTO also utilises isotopic techniques for medical, scientific and agricultural research. Research undertaken at ANSTO's Australian Synchrotron has helped enhance the medical community's understanding of COVID-19.

A primary function of ANSTO, as mandated by the *Australian Nuclear Science and Technology Organisation Act 1987* (ANSTO Act), is to "act as a means of liaison between Australia and other countries in matters related to its activities". In this capacity, ANSTO is recognised as a global leader in nuclear science and technology. The organisation maintains over 50 bilateral relationships, and represents Australia's interests in several multilateral and regional fora, including the International Atomic Energy Agency, the Regional Cooperative Agreement and the Forum for Nuclear Cooperation in Asia.

ANSTO is therefore well placed to provide comment to the inquiry, particularly in regard to the following term of reference:

a. the suitability of existing regional architecture and country-groupings to address key human security issues in the Indo-Pacific, including health security, the impacts of climate change, human rights and labour rights;

2. Australia's Involvement in the IAEA

Australia has historically taken leading roles in regional and international organisations dealing with nuclear issues, and it is important that we continue this leadership to progress our national interests. The IAEA is arguably the most important international body across all nuclear issues and is known as the United Nations' "nuclear watchdog". Australia was a founding Member State of the IAEA and has strongly supported its safeguards activities in support of the Non-Proliferation Treaty (NPT). While this is an important aspect of its mandate, the IAEA is also the central international organisation for nuclear safety, nuclear security, both power and non-power applications of nuclear technology, and Technical Cooperation, which is the Agency's programme for assisting the socio-economic development of Member States using nuclear technology. ANSTO leads Australia's activities at the IAEA in Nuclear Energy, Nuclear Applications, and Technical Cooperation, and supports Government with the provision of technical advice across the Agency's other activities.

The Technical Cooperation Programme is the Agency's primary mechanism for transferring nuclear technology and expertise to developing Member States, helping them to address key development priorities in areas such as health and nutrition, food and agriculture, water and the environment, industrial applications, energy, and radiation safety. The Programme is highly aligned with the United Nations Sustainable Development Goals, directly contributing to implementation of nine of the seventeen goals. As a developed country with sophisticated nuclear science and technology

expertise, Australia – through ANSTO – works with the IAEA to support the Technical Cooperation Programme, particularly in the Asia-Pacific region.

Participation in IAEA programmes by ANSTO has direct policy benefits for Australia. The chief policy-making organisation of the IAEA is the Board of Governors, a body of 35 Member States which directs the Agency's programme and budget. Membership consists of 13 permanent members who are the most advanced in nuclear science and technology, with at least one from each regional group, and 22 non-permanent members who are elected to serve two-year terms. The South-East Asia and Pacific (SEAP) group – of which Australia is a part – has one permanent member, one non-permanent member, and two rotational, non-permanent members that are shared with other regional groups.

Historically, Australia has held the permanent position in SEAP as the most advanced country in the region in nuclear science and technology. To keep justifying this position, Australia needs to maintain high-quality expertise and capacity in nuclear science and technology, as well as engage with the IAEA and its Member States, particularly those from SEAP, in its activities. Without active participation and support of all the IAEA programmes (see Case Studies A, B and C, for examples), our permanent position on the Board of Governors could come under threat, in turn risking our ability to influence the IAEA's direction on national foreign policy priorities such as non-proliferation and nuclear safety.

Case Study A: Heath Security

Programme of Action for Cancer Therapy

As developing nations improve their standard of living, cancer is becoming a greater human health issue for their citizens. Cancer kills more people globally than tuberculosis, AIDS and malaria combined. In developing nations, it is estimated that 70% of cancers are diagnosed too late for effective treatment. The Programme of Action for Cancer Therapy (PACT) is an IAEA-led initiative that aims to alleviate cancer in the developing world. Working with partners including the World Health Organisation (WHO), the International Agency for Research on Cancer (IARC) and the Union for International Cancer Control (UICC), PACT undertakes a variety of activities to better define the cancer burden in developing nations, and implement sustainable and effective radiation treatment programmes.

PACT is particularly active in the Asia-Pacific region, and Australia has worked with PACT in this regard given our socio-economic development, regional and strategic priorities. In recent years, review missions have utilised Australian experts to assess cancer rates, programmes and needs in Papua New Guinea and Fiji. Australia has also made financial contributions to support PACT activities and regularly provides technical expertise to IAEA Technical Cooperation projects to improve training and treatment outcomes in the region through the use of nuclear medicine diagnostic techniques and radiation treatment.

Case Study B: Strategic Cooperation

IAEA Scientific Visitors and Fellowships

ANSTO regularly hosts and facilitates IAEA Scientific Visits and Fellowships on behalf of Australia. This program helps develop nuclear science and technology expertise in developing countries across a wide variety of fields, and also builds people-to-people links across borders. During the 2017-2019 period, a total of 84 visits were completed, with 75 of those visitors coming from Asia and the Pacific. This strong support of regional countries and individuals demonstrates the impact that ANSTO has on the Indo-Pacific region by means of collaboration and support of IAEA programmes.

Case Study C: Climate Change

IAEA Collaborating Centre

In March 2021, ANSTO was designated an IAEA Collaborating Centre on *New and Advanced Techniques and Applications of Nuclear Science and Technology Towards a Sustainable Environment*. The Collaborating Centre program formally recognises the expertise a Member State institution has in a particular area, and its ability to contribute to the objectives of the IAEA. ANSTO has twice previously been designated a Collaborating Centre by the IAEA, focusing on our landmark infrastructure including the OPAL reactor, Australian Centre for Neutron Scattering, Australian Synchrotron, and Centre for Accelerator Science (CAS).

The new designation focuses on ANSTO's expertise and capacity to contribute to environmental outcomes, particularly in Asia. Over four years, it will include substantive programs of work on food provenance and authentication, isotope hydrology, study of archaeological and culturally significant sites, and the uses of nuclear techniques to study climate change. While the Collaborating Centre will have a global reach, there will be a particular focus on collaboration with regional countries and the shared environmental challenges faced, including climate change.

2.1 Regional Cooperative Agreement

Australia plays a leading role in the IAEA's major regional forum for nuclear science and technology cooperation, the Regional Cooperative Agreement (RCA) for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific. The RCA is an IAEA-centred and treaty-based programme for implementation of Technical Cooperation in Asia and the Pacific, consisting of some 22 member countries.

As the national centre of excellence for nuclear science and technology, ANSTO is the appointed National Representative to coordinate Australian participation in the RCA and contributes to its policy discussion. ANSTO works with subject matter experts from Australian Government, academia, industry, and the health sector to contribute to all 17 active RCA projects on a variety of topics including human health, environmental management, agriculture, and industrial applications. Australia leads four of the active projects, including on Enhancing Medical Physics Services (see Case Study D below).

ANSTO's participation in the RCA delivers other benefits for scientists and Australia more broadly. Through participation in RCA projects, Australian scientists and medical professionals develop extended professional networks that deliver benefircal outcomes and have led to enhanced bilateral collaboration. For example, through our participation in RCA projects on environmental management, ANSTO and its Indonesian counterpart agency, BATAN, have developed a productive

MOU that has enabled more specific collaboration in this area, as well as expanding to include collaboration on nuclear forensics and crime scene management. ANSTO's participation in the RCA also helps develop institutional-level links that help us deliver on our mandate to inform Government on regional developments in nuclear science and technology.

The RCA and the Technical Cooperation Programme more broadly are important – arguably the most important – aspects of the IAEA's work for countries in our region, so our participation in the Agreement is vital to maintaining our position on the IAEA Board of Governors as described above. Furthermore, our participation in this programme is the prime manner in which Australia demonstrates its compliance with international law, specifically Article IV (2) of the NPT:

> *"All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also co-operate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world."*

Case Study D: Health Security

RCA – Enhancing Medical Physics Services in Developing Standards, Education and Training through Regional Cooperation – Canberra Hospital

Due to the growth of radiotherapy in the region, there is a strong need for well-trained clinical physicists for effective and safe application of radiotherapy. Some Member States are either in isolated situations or lack experienced staff. Australia, through Canberra Hospital, leads an RCA project that is :

- Improving regional access to clinical training programs and individual learning in developing countries, regional centres and small departments through implementation of an e-learning platform;
- Increasing the number of medical physicists available as registrars and supervisors in clinical training programs in the region;
- Developing a regional group of external supervisors and assessors to support emerging and isolated medical physics facilities in developing countries; and
- Developing and assisting implementation of agreed regional standards in medical physics certification and accreditation.

3. Forum for Nuclear Cooperation in Asia

The 12-member Forum for Nuclear Cooperation in Asia (FNCA) is a Japanese-led initiative that focuses on cooperative research and development of nuclear techniques. The member countries are Australia, Bangladesh, China, Indonesia, Japan, Kazakhstan, Republic of Korea, Malaysia, Mongolia, Philippines, Thailand and Vietnam. The FNCA aims to facilitate research and information exchange in a variety of fields, with active projects in agriculture, human health, research reactor utilisation, and waste management. ANSTO represents Australia at the FNCA and participation in

its projects. ANSTO is the only country outside of hosts Japan to lead an FNCA project, specifically on Climate Change Science (see Case Study E below).

As well as further demonstrating our leading position in nuclear science and technology in our region, Australia's active participation in support of the FNCA also strengthens Australia's bilateral relationships in the region, particularly with Japan. It also helps ANSTO to keep abreast of nuclear science and technology developments within the region, particularly in advanced nuclear countries such as China, Republic of Korea, and Japan.

Case Study E: Climate Change

FNCA Climate Change Science Project

Australia leads a project under the FNCA which uses nuclear and isotopic-based techniques to support research into past climate change. This multi-disciplinary research combines radionuclide and stable isotope analysis, conventional analytical techniques, and ecological modelling to obtain datasets that allow reconstruction of high-resolution climate records, from a variety of different indicators that have been archived in the environment. Using radionuclides and isotopes, the project aims to characterise past climate change to help interpret drivers of the Earth's climate system. Climate information is obtained from lake sediments, tree-rings, coral and landscape ecosystems, and river basins.

4. Global Initiative to Combat Nuclear Terrorism

The Global Initiative to Combat Nuclear Terrorism (GICNT) is a joint US and Russian initiative to strengthen global capacity to prevent, detect and respond to possible acts of nuclear terrorism. Established in 2006, the Initiative has grown to include 89 Partner Nations (of which Australia was among the first) and six international organisations. It has a cross-disciplinary approach, bringing together all stakeholders involved with countering nuclear terrorism, including policy and decision makers, foreign affairs specialists, intelligence and law enforcement agencies, nuclear technicians, first responders and health professionals. It focuses on practical implementation with regular tabletop and field exercises at the domestic, regional and international levels.

Australia, through ANSTO, has taken a prominent leadership position in the GICNT, particularly within our region. In the last decade, we have hosted or co-hosted a number of major technical meetings and exercises across the region including in Australia, Philippines, Malaysia and Thailand. We were also Chair of the Nuclear Forensics Working Group between 2010 and 2017. This leadership has helped give Australia an important voice on nuclear security issues, not just in the GICNT, but through other global policy fora such as the IAEA and the 2010-16 Nuclear Security Summit process.

5. Conclusion and Recommendations

Australia's engagement in regional nuclear science and technology architecture directly supports our national interests. It contributes to improved socio-economic development in key areas of regional importance such as human health and climate change, directly leading to a more stable and secure region. It provides Australia with visibility of nuclear technology developments and helps us demonstrate our compliance with international law such as the Non-Proliferation Treaty. It builds people-to-people links which endure long after the project or training course has concluded. Perhaps

most importantly, participation in regional activities of the IAEA, RCA, FNCA and GICNT demonstrates our leadership on nuclear issues within the Asia-Pacific, giving Australia a seat in fora such as the IAEA Board of Governors. This in turns gives us a strong international policy voice on issues of national importance like nuclear safeguards, security and safety.

It is therefore vital that Australia continues to actively support and participate in these regional nuclear fora. This support needs to be demonstrated through the effective application of our foreign policy assets and capabilities. Specifically, Australia needs to:

- Continue policy support for key international and regional nuclear organisations such as the IAEA, including the RCA.
- Reconfirm, and where needed, regularise Australia's payment of contributions to key international nuclear organisations such as the IAEA. This includes the IAEA Technical Cooperation Fund.
- Where appropriate, consider making extra-budgetary contributions to key international and regional nuclear programmes such as the IAEA, RCA and FNCA on issues in which Australia has a significant interest.

6. Further Information

For more information on ANSTO and its capabilities relevant to this inquiry, please contact international.liaison@ansto.gov.au.