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Submission to Senate Foreign Affairs, Defence and Trade Legislation Committee

re: Inquiry into Australian Naval Nuclear Power Safety Bill 2023 [Provisions] and Australian Naval Nuclear Power Safety (Transitional Provisions) Bill 2023 [Provisions]

from: Associate Prof Tilman Ruff AO, board member and founding chair, on behalf of International Campaign to Abolish Nuclear Weapons (Australia)

1 Feb 2024

About ICAN

The International Campaign to Abolish Nuclear Weapons (ICAN) is a broad international campaign coalition focused on mobilising civil society around the world towards prohibiting and eliminating nuclear weapons. ICAN is a coalition of 652 partner organisations in 110 countries, including 75 in Australia. ICAN's evidence-based approach is rooted in the catastrophic humanitarian consequences of any use of nuclear weapons, and the imperative for their elimination in order to prevent nuclear war. We promote adherence to and implementation of the United Nations Treaty on the Prohibition of Nuclear Weapons (TPNW).

ICAN was founded in Melbourne in 2006 by International Physicians for the Prevention of Nuclear War (Nobel Peace prize 1985) and its Australian affiliate, the Medical Association for Prevention of War. In 2017, ICAN became the first Australian-born entity to be awarded the Nobel Peace Prize, for our “work to draw attention to the catastrophic humanitarian consequences of any use of nuclear weapons” and our “ground-breaking efforts to achieve a treaty-based prohibition of such weapons”.

Deep concerns about nuclear-powered submarine proliferation to Australia

ICAN Australia is deeply concerned about the government's plan for Australia to acquire nuclear-powered submarines. Given our mandate and focus, our principal concerns relate to the following, among many adverse consequences of the plan:

- It exacerbates regional tensions, fuels an arms race and risks of war in the Asia-Pacific region, particularly involving China and the United States, and increases the danger of nuclear escalation of any such conflict;
- It further locks in Australia to unavoidably becoming embroiled and a target in any Asia-Pacific war involving the United States;
- It involves proliferation and erosion of control of fissile materials from which nuclear weapons can be built;

- It damages nuclear non-proliferation, particularly the nuclear Non-Proliferation Treaty (NPT), which successive Australian governments claim to strongly support and regard as the cornerstone of the international nuclear disarmament and non-proliferation regime, and it also damages the associated nuclear safeguards regime administered by the International Atomic Energy Agency (IAEA).

Therefore our specific recommendations regarding the naval nuclear power bills in question should not be taken to indicate ICAN Australia supports or accepts as inevitable delivery of all the various stages of the long-term, complex, exorbitantly costly, multistage AUKUS nuclear-powered submarine acquisition plan.

1. Good governance and radiation protection

A competent, independent public service, evidence-based policy processes and accountability are essential to good governance, particularly in relation to complex, high risk and high consequence technologies such as nuclear ones. A fundamental and core principle of good governance is thorough independence of regulatory bodies, with avoidance of conflicts of interest, particularly structural ones, robust transparency and accountability provisions, strong measures to avoid collusion, corruption and regulatory capture, and processes which keep public interest and safety central at all times.

We are therefore dismayed that the government proposes that the regulation of the most high risk and costly nuclear activities ever undertaken by an Australian government be carried out by a new entity within Defence, the organisation responsible for delivering the nuclear submarine program, and answerable to the defence minister. This is an entirely inappropriate and unacceptable sidelining and undermining of Australia's established independent nuclear regulatory and radiation protection organisation, ARPANSA.

Because of its importance and cogency, we are sure that multiple submissions will draw the Committee's attention to the [13 October 2022 letter to the ARPANSA CEO](#)¹, Dr Gillian Hirth, from Dr Roger Allison, the chair of the Radiation Health and Safety Advisory Council. We urge the Committee to thoroughly consider this seminal document, which makes a compelling case against the bills in question which would establish a new regulator, the Australian Naval Nuclear Power Safety Regulator (ANNPS). Key points from this letter with which we are in strong agreement are reproduced below (our emphasis added):

¹ Allison R. Australian Government Radiation Health and Safety Advisory Council. Letter to ARPANSA CEO Dr Gillian Hirth. 13 Oct 2022. <https://www.arpansa.gov.au/sites/default/files/documents/2023-03/RHC%20Letter%20to%20the%20CEO%20-%20Regulatory%20principles%20for%20nuclear%20powered%20submarines%2C%20October%2022.pdf>

"Given actual and perceived health and safety risks of nuclear-powered submarines, a robust and effective regulatory framework in Australia is essential and should be a priority."

"A regulatory body of nuclear-powered submarines must have public safety as its primary focus, together with a strong safety culture."

"It is important that the framework does not allow 'national security' to mask inadequate radiation safety protection of the Australian public, weaken regulatory authority, or inhibit transparency on matters of Australian public safety."

"Council highlights the importance of independence of the regulatory authority. ... Independence of the regulator is a critical part of its effectiveness. The regulator should be independent of the operators and departments overseeing any aspect of purchase, manufacture, maintenance, and operation of the program."

"Reporting arrangements should therefore enable the regulatory body to be able to provide safety related information to the Government and the public with the maximum amount of transparency."

"Council considers that there are challenges in Australia's federated and fragmented radiation regulatory system particularly as it relates to emergency preparedness, interstate transport, and logistics; and radioactive waste which are key aspects of any future nuclear regulatory activities."

"... nationally integrated emergency management arrangements do not exist for large scale radiological or nuclear incidents. ... The national strategy for radiation safety acknowledges the limitations of emergency management arrangements in Australia. They are not fit for purpose for a future with nuclear powered submarines."

This letter makes a compelling and indeed sufficient case as to why ARPANSA should be empowered and equipped to regulate all nuclear activities in Australia, including challenging new risks associated with nuclear-powered submarines.

It is notable that the proposed bills do not comply with the standards of the International Atomic Energy Agency (IAEA), which the government claims to support. The IAEA sets out in its [Governmental, Legal and Regulatory Framework for Safety](https://www.iaea.org/publications/10883/governmental-legal-and-regulatory-framework-for-safety)² in nuclear activities and use of radiation sources (Requirement 4: Independence of the regulatory body) that:

² IAEA, Governmental, Legal and Regulatory Framework for Safety. 2016. [IAEA Safety Standards Series](https://www.iaea.org/publications/10883/governmental-legal-and-regulatory-framework-for-safety) No. GSR Part 1 (Rev. 1). General Safety Requirements. <https://www.iaea.org/publications/10883/governmental-legal-and-regulatory-framework-for-safety>

"The government shall ensure that the regulatory body is effectively independent in its safety related decision making and that it has functional separation from entities having responsibilities or interests that could unduly influence its decision making."

A system in which the regulator is part of the department implementing the nuclear-powered submarine program and answerable to the minister overseeing the activities being regulated is most clearly not "functional separation", and such a regulator would clearly violate the requirement for independence.

One must ask for whose benefit the government proposes AUKUS submarines be regulated through an intrinsically structurally conflicted new agency within Defence, with less accountability and transparency provisions than ARPANSA, which will struggle to acquire from scratch the competence and experience commensurate to the challenging task? Does it serve Australian public interest, or does this inappropriate and corrupted plan serve the interests of parties with vested interests in nuclear-powered submarine acquisition, including foreign entities? Such an arrangement certainly does not serve good governance in the best interests of the Australian people and their health and safety.

Structurally conflicted entities lacking in independence, accountability and transparency such as the proposed Australian Naval Nuclear Power Safety Regulator (ANNPSR) have no place in good governance in Australia, especially in relation to such a massive transformational undertaking as acquisition of nuclear-powered submarines, involving substantial risks to public safety. Passage of the proposed bills would set a bad precedent, increase the risks to the health, safety and security of Australians from such a momentous new nuclear enterprise in our country, and make bad governance of other aspects of the nuclear submarine program more likely.

2. Fissile material, radioactive waste and proliferation risks

Visiting UK and US submarines and any second-hand US Virginia class submarines Australia acquires will be fuelled by highly-enriched uranium (HEU), as both US and UK nuclear-powered submarines utilise uranium enriched to 97.3% uranium-235, the same as in their nuclear weapons. Such fuel requires no further enrichment to be used in nuclear weapons. Funding and work on the use of low-enriched uranium (LEU) as naval reactor fuel has been undertaken in the US for a number of years and continues. Use of LEU in naval reactors is entirely feasible - current French and Chinese nuclear-powered submarines use LEU. LEU has the major advantage that it cannot be used for nuclear weapons. Regrettably however, as currently envisaged it is likely that future SSN-AUKUS submarines will also be fuelled with HEU.

This acquisition would likely happen by Australia becoming the first non-nuclear-armed state with an INFCIRC/153/Rev2 type Comprehensive Safeguards Agreement (CSA) in force to exploit a loophole in Paragraph 14 of such CSAs. This loophole allows for the

temporary “Non- Application of Safeguards to Nuclear Material to be used in Non-Peaceful Activities,” generally interpreted to refer to nuclear-powered submarines and ships, and other non-explosive military uses such as military space vehicles, and nuclear reactors and radio-thermal generators for military bases or isolated radar stations. There is no definition of “non-peaceful or non-proscribed nuclear military activities” and this has never been tested at the IAEA Board of Governors or at NPT Review Conferences.

ICAN Australia's report: *Troubled waters: nuclear submarines, AUKUS and the NPT*³ includes contributions by Australian and international safeguards, non-proliferation, legal, and international relations experts, including:

- Tariq Rauf, Former Head of Verification and Security Policy Coordination at the International Atomic Energy Agency;
- Monique Cormier, Monash University international law expert;
- Trevor Findlay, Australian safeguards expert, University of Melbourne, on how the acquisition of nuclear submarines would undermine Australia's safeguards credentials;
- Muhadi Sugiono, Gadjah Mada University, Indonesia, on the Indonesian and other southeast Asian responses;
- Richard Tanter, University of Melbourne nuclear weapons expert; and
- Talei Luscia Mangioni, Australian National University, on Pacific perspectives on the AUKUS nuclear submarine deal.

This report may provide useful background for Committee members.

2.1 Concern about nuclear-powered submarine proliferation at the 2022 NPT Review Conference (RevCon)

While all AUKUS partner governments claim: "Australia's acquisition of conventionally-armed, nuclear-powered submarines will be carried out in a manner that sets the highest non-proliferation standard" ⁴, this claim essentially cannot be met for a mobile, submarine, stealth platform containing large amounts of weapons-usable fissile material.

The NPT's object and purpose as stated in its preamble is broad, including: "Considering the devastation that would be visited upon all mankind by a nuclear war and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples."

At the 2022 NPT RevCon, a number of nations raised concerns about Australia's nuclear submarine plan. The precedent of a non-nuclear-armed state taking nuclear material out of safeguards for military purposes has not yet been established. As argued by Tariq

³ ICAN Australia. *Troubled waters: nuclear submarines, AUKUS and the NPT*. July 2022. <https://icanw.org.au/troubled-waters/>

⁴ Australian Government Australian Submarine Agency. AUKUS and non-proliferation. <https://www.asa.gov.au/sites/default/files/2023-06/NonProliferation-Factsheet.pdf>

Rauf in ICAN Australia's *Troubled Waters* report, and by the Chinese government in RevCon Working Paper 50⁵ on the AUKUS nuclear submarine cooperation and Working Paper 29 on non-proliferation, all IAEA member states have an interest in preventing such a potential weakening of safeguards, through the IAEA Board of Governors and General Conference.

In RevCon Working Paper 67, "Indonesia notes with concern the potential consequences of nuclear-powered submarine capability sharing to the global non-proliferation regime." They raise safety, environmental and humanitarian risks, and concerns that sharing of nuclear technologies and materials for military purposes "could run counter to the spirit and objectives of the NPT", set a precedent and "complicate safeguards mechanisms", and there "is a driving urgency for the NPT Review Conference and beyond to address such a raising challenge", particularly in relation to HEU. The paper states: "Indonesia views that any cooperation involving the transfer of nuclear materials and technology for military purposes from Nuclear-Weapon States (NWS) to any Non-Nuclear Weapon States (NNWS) increases the associated risks ... posed by potential proliferation and conversion of nuclear material to nuclear weapons, particularly HEU in the operational status of nuclear naval propulsion."

RevCon Working Paper 14 by Netherlands, Norway and the Republic of Korea on minimising HEU civilian stocks and use commends the substantial work done to date to remove HEU from civilian applications - to which Australia previously contributed - and notes that as a result, South America and Southeast Asia are free of HEU, and in Africa all facilities previously using HEU no longer do. The paper notes: "Efforts to reduce stocks of highly enriched uranium and to minimize and eventually eliminate the use of highly enriched uranium are a form of permanent threat reduction and a fundamental element in our shared efforts to strengthen nuclear security."

The Communique from the first Nuclear Security Summit, in Washington DC in April 2010⁶ stated (para. 3): "[We] recognize that highly enriched uranium and separated plutonium require special precautions and agree to promote measure to secure, account for and consolidate these materials, as appropriate; and encourage the conversion or reactors from highly enriched to low enriched uranium fuel and minimization of use of highly enriched uranium, where technically and economically feasible."

The AUKUS partners had previously been actively supporting global civilian HEU minimisation. Australia has eliminated HEU from its domestic nuclear reactor. A long-standing non-proliferation goal committed to in multiple previous NPT RevCon outcome documents, and ostensibly supported by the AUKUS partners, is the negotiation of a

⁵ All 2022 NPT Review Conference working papers are available at:

<https://reachingcriticalwill.org/disarmament-fora/npt/2022/papers>

⁶ The White House. Communique from the first Nuclear Security Summit. 13 April 2010.

<https://obamawhitehouse.archives.gov/the-press-office/communique-washington-nuclear-security-summit>

treaty curtailing fissile materials. Australia's nuclear-powered submarine plan is inconsistent with and undermines control and reduction of fissile materials.

Each of eight nuclear submarines proposed for Australia would likely contain at least 200 – 250 kg⁷ and potentially up to 500 kg⁸ of weapons-grade HEU - 8–20 times the IAEA-stipulated Significant Quantity of 25 kg - in each mobile submarine spending many months at a time in the deep ocean unable to be located, let alone inspected. However, a 1st-generation implosion-type nuclear weapon could be built with 15-18 kg of HEU, and a 2nd generation single-stage nuclear weapon could be made with only 12 kg of HEU.⁹ The IAEA Safeguards Glossary defines the conversion time for producing a nuclear weapon as 1–3 weeks for unirradiated HEU and 1–3 months for irradiated HEU fuel. The IAEA's timeliness detection goals cannot be met for HEU submarine fuel.

A non-nuclear-armed state like Australia taking large amounts of fissile material out of safeguards would be a dangerous precedent and increase the risk that other states might exploit this loophole and divert material to manufacturing nuclear weapons. Since the AUKUS announcement, Iran has cited interest in nuclear-powered submarines as an additional justification for its program of expanding HEU production. Nuclear-powered submarines have been pursued previously by Canada, and interest has been expressed by Republic of Korea and reportedly Japan. Brazil is well advanced with developing an indigenous nuclear submarine powered by low-enriched uranium (LEU). Australia had ambitions to acquire nuclear weapons in the 1950s and 60s, and even if Australia has no currently foreseeable ambition to acquire nuclear weapons, there is no guarantee that this will always be so.

If Australia prides open the CSA Paragraph 14 safeguards loophole and established the precedent of proliferation of nuclear-powered submarines in a non-nuclear-armed state, it will not be the last to do so, and will also encourage the spread of uranium enrichment capacity.

2.2 Australia's non-proliferation obligations and effective application of nuclear safeguards

The proposed ANNPS Bill (Section 133) and the ARPANS Act (Section 9) have an important difference relating to their interaction with the *Nuclear Non-Proliferation (Safeguards) Act 1987*. The ARPANS Act (Section 84) requires that “the exercise of the power or discretion or the performance of the duty or function is authorised by this Act

⁷ Rauf T. Run silent! run deep! Sink IAEA safeguards? IDN-InDepthNews 7 Mar 2023.

<https://indepthnews.net/run-silent-run-deep-sink-iaea-safeguards/>

⁸ Philippe S. The new Australia, UK and US nuclear submarine announcement: a terrible decision for the nonproliferation regime. Bulletin of the Atomic Scientists 17 Sep 2021.

<https://thebulletin.org/2021/09/the-new-australia-uk-and-us-nuclear-submarine-announcement-a-terrible-decision-for-the-nonproliferation-regime/>

⁹ International Panel on Fissile Material. Global Fissile Material Report 2022. (Appendix). July 2022.

<https://fissilematerials.org/library/gfmr22.pdf>

only to the extent that the exercise or performance **is not inconsistent** with Australia's obligations under the relevant international agreements." (emphasis added)

The ANNPS Bill in Section 133 gives primacy to the ANNPS Bill over the Nuclear Non-Proliferation (Safeguards) Act 1987, in stating: "This Act [the Non-Proliferation Act] does not exclude the operation of the *Nuclear Non-Proliferation (Safeguards) Act 1987*, to the extent that the *Nuclear Non-Proliferation (Safeguards) Act 1987* is capable of operating concurrently with this Act."

Section 136 of the proposed ANNPS Bill only requires that: "If this Act confers a function on a person, the person **must have regard to** Australia's obligations under any international agreement prescribed by the regulations in performing that function" (emphasis added). This is inadequate and concerning, and different from the ARPANS Act. Australia's non-proliferation obligations and effective application of nuclear safeguards must not be weakened by the planned nuclear-powered submarine acquisition.

2.3 HEU waste is still weapons-usable

We note that other submissions to the Committee's inquiry will address various aspects of management of the radioactive waste from AUKUS submarines. The particular aspect that ICAN Australia wishes to highlight to Committee members is that not only is the fuel for HEU naval propulsion reactors weapons-grade, but the spent fuel is still weapons-usable. This means that at every stage of its management and disposal, over geological timeframes much longer than the history of any human institution, AUKUS submarine fuel and spent fuel must not only be kept isolated from humans and the environment, but under the highest level of military security.

Australia has no experience and no track record in long-term management of high-level radioactive waste, particularly weapons-usable radioactive waste. Indeed no country has an operating repository for high-level radioactive waste; only one repository, under construction in Finland, is expected to begin burying waste this decade. The only operating deep underground repository for *intermediate*-level waste, the Waste Isolation Pilot Plant in the United States, was shut for three years following a February 2014 chemical explosion resulting from incompetent management, cost-cutting and regulatory failures.¹⁰

US and UK naval nuclear reactors are sealed units not designed for refuelling; accessing the reactor and its spent fuel requires the submarine hull to be cut open. The 22 out-of-service UK nuclear-powered submarines are stored in naval dockyards at Devonport (15) and Rosyth (7). A 'demonstrator' project on full dismantlement of HMS Swiftsure is underway at Rosyth and due for completion at the end of 2026. Nine of the submarines

¹⁰ Green J, Hawkins D. The politics of waste disposal: lessons from Australia. Asia-Pacific Leadership Network Jan 2024. <https://cms.apln.network/wp-content/uploads/2024/01/Green-Hawkins-January-2024.pdf>

at Devonport still carry their nuclear fuel.¹¹ Nuclear fuel from other submarines has been stored at Sellafield, initially for several years in spent fuel pools. The UK does not have a Geological Disposal Facility for radioactive waste, including naval spent reactor fuel and reactor pressure vessels, despite a site selection process having been commenced in 2008.

The US does not yet have a permanent disposal site for naval reactor spent fuel. Spent fuel is stored at Idaho National Laboratory; reactor vessels from which the spent fuel has been removed are placed in open dry storage at Hanford in Washington state.¹²

Security is mentioned in extreme and generalised brevity in the ANNPS Bill (section 32 and 92), and without any specific reference to reactor fuel, both fresh and spent. This is inadequate.

Recommendations

1. ICAN Australia opposes Australia acquiring nuclear-powered submarines.

At a fundamental level, ICAN Australia does not support the proposed bills as we believe Australia acquiring nuclear-powered submarines should not proceed. ICAN Australia is concerned that such acquisition will increase regional tensions, the arms race in north-east Asia, risks of war and nuclear escalation, and make it more difficult for Australia to avoid becoming a party and/or a target in any war in Asia involving the US. It will also undermine nuclear non-proliferation and control of fissile materials. At a time of existential nuclear weapons dangers and climate/nature jeopardy, we believe the nuclear submarine plan is counterproductive and undermines the security of Australians, the region and the globe.

2. ARPANSA should regulate all nuclear activities.

If the nuclear submarine acquisition proceeds, ICAN believes good governance demands independent, non-conflicted, competent, transparent and accountable regulation of the safety, radiation protection and radioactive waste management aspects of the acquisition, and therefore recommends that ARPANSA should be the body which regulates these. An agency within Defence regulating a Defence project would be improper. We therefore believe the bills under consideration should be rejected.

3. Australia's nuclear non-proliferation obligations and effective and consistent application of nuclear safeguards must not be compromised by the planned nuclear submarine acquisition.

¹¹ Nuclear Information Service. Devonport. A nuclear Information Service Briefing. Dec 2023.

<https://www.nuclearinfo.org/wp-content/uploads/2024/01/Devonport-briefing.pdf>

¹² Engelson A. Spent naval nuclear reactor compartments: Part of Hanford's complicated issues. Columbia Insight 20 July 2023. <https://columbiainsight.org/spent-naval-nuclear-reactors-part-of-hanfords-complicated-issues/>

Any weakening of Australia's nuclear non-proliferation and safeguards regime or their application as a result of nuclear-powered submarine acquisition would be unacceptable.

4. Management of HEU fuel, including spent fuel, requires high levels of both safety and security.

Spent HEU fuel will still be weapons-usable and therefore requires not only effective isolation from humans and the environment at every step of its management and disposal, but consistent maintenance of military levels of security. This is not adequately addressed in the proposed bills.

5. Planned nuclear-powered submarine acquisition makes it even more important that Australia join the Treaty on the Prohibition of Nuclear Weapons (TPNW).

Especially in the context of nuclear-powered submarine acquisition, Australia's nuclear non-proliferation policies, practices, legislation and credentials could best be strengthened by Australia joining the Treaty on the Prohibition of Nuclear Weapons. This would be the most effective and enduring way for Australia to ensure and demonstrate that nuclear-powered submarines will not, now or in the future, become a prelude to the acquisition, stationing or delivery of nuclear weapons by Australia.

ICAN Australia would welcome the opportunity to give evidence in-person to the Committee.

Yours sincerely,



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I acknowledge the Boonwurrung, Taungurung and Muwinina people as the traditional custodians of the lands where I live and work.

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