By Trevor Findlay

The Australia-UK-U.S. Submarine Deal

Not Necessarily a Sure or Good Thing

In June 1987, Canada announced that it intended to build 10 to 12 nuclear-powered submarines, based on a French or UK design and fueled with highly enriched uranium (HEU) possibly of Canadian origin. Faced with insurmountable strategic, political, financial, logistical, and nonproliferation obstacles, the idea sank without trace within two years.[1] Although the Australian nuclear-powered submarine proposal, announced 34 years later on September 16, is different in several respects, it faces equally strong headwinds that may deliver the same result.

Much about the Australian project is speculative. Australian Prime Minister Scott Morrison, U.S. President Joe Biden, and UK Prime Minister Boris Johnson simply released a one-page statement launching "an enhanced trilateral security partnership" called AUKUS aimed at fostering "deeper integration of…security and defense-related science, technology, industrial bases, and supply chains."[2] The headline-grabbing item was the announcement of a trilateral effort to support Australia in acquiring nuclear-powered submarines, beginning with an 18-month study to seek "an optimal pathway to deliver this capability." No numbers were announced, no likely design was suggested, and no nuclear fuel type or acquisition plan was outlined. Although all three partners committed themselves to "the highest standards for safeguards, transparency, verification, and accountancy measures to ensure the non-proliferation, safety and security of nuclear material and technology," the length of this list alone suggests that complex and profound questions arise not just for the three governments, but for the international community, particularly the global regime governing the use of nuclear energy.

Knowns and Unknowns

At this stage, the unknowns of the project are Rumsfeld-esque in their tortuousness and interrelatedness. Yet, there are some knowns or likely knowns to guide preliminary analysis.

First, for parochial political reasons, the submarines must be built in Australia for the most part, specifically in Adelaide, in the state of South Australia. Australia's conventionally powered submarines have been built there for decades, resulting in a skilled, specialized workforce. One of the smallest and economically challenged of

Trevor Findlay is a principal fellow in the School of Social and Political Sciences at the University of Melbourne. His next book, *Transforming IAEA Safeguards Culture: The IAEA, Iraq, and the Future of Nonproliferation*, will be published in early 2022.

A Royal Australian Navy diesel and electric-powered Collins Class submarine sits in Sydney Harbour in 2016. That naval weapon is to be replaced by nuclear-powered submarines that the United Kingdom and the United States recently agreed to provide Australia as part of the new AUKUS defense alliance. (Photo by Peter Parks/AFP via Getty Images)

Australia's states but electorally important, South Australia has relied on government-funded projects to boost employment and capacity in its industrial sector. The joint project with France to produce conventionally powered submarines that was unceremoniously cancelled seemingly minutes before the AUKUS announcement, required 50 percent Australian "content," down from the originally expected 75 percent. Australia's purchase of U.S. or UK submarines off the shelf, as some have suggested, would seem politically untenable.

A second known factor is that Australia cannot produce enriched uranium itself whether low-enriched or highly enriched, for submarine propulsion or any other purpose, despite having among the largest deposits of uranium in the world. It does not have the industrial, technical, or financial capacity or political license to build and operate a standard gas-centrifuge plant. Australia sold off its domestically invented SILEX laser-enrichment technology to the United States two decades ago.[3] In any case, Australian federal law prohibits uranium enrichment in the country. Enriched uranium for submarines would need to be imported.

A third certainty is that Australia does not have any current or likely future capacity to build a nuclear reactor, especially for submarine propulsion. Unlike Canada, which developed and operates CANDU reactors, Australia has no experience with nuclear reactors beyond research units based at Lucas Heights in Sydney. The latest model, devoted largely to producing medical radioisotopes, was imported from Argentina. Therefore, Australia would need to buy the reactor and its fuel from the United Kingdom or the United States. If HEU is chosen, the reactors will contain "lifetime cores," which will operate for around 30 years and require no refueling, a much prized characteristic of HEU-powered vessels. The sealed reactors would presumably be transported by ship to Adelaide to be encased in the submarine hulls and returned to the provider at the end of the submarines' lifetime for dismantlement and disposition of the spent fuel.

A final important area of clarity is that Australia is seeking to arm its submarines with conventional weapons, presumably sea-launched cruise missiles, not nuclear weapons. For decades, Australia has been a dedicated supporter of the nuclear nonproliferation regime and more recently of the global nuclear security architecture. After initial reservations, Australia signed the nuclear Nonproliferation Treaty (NPT) in February 1970, just before it entered into force, and ratified it in 1973. It has subsequently become one of the strongest champions of the treaty and of the International Atomic Energy Agency (IAEA) and its safeguards system.

Australia not only has a comprehensive safeguards agreement as required by the NPT, but also imposes bilateral safeguards on Australian-origin uranium exports. It was the first country to sign an additional protocol to its safeguards agreement and was the first to receive the so-called broader conclusion, indicating that it has accounted for all nuclear material subject to safeguards in its territory. Australia was instrumental in negotiations on the 1985 Treaty of Rarotonga, which created a nuclear-weapon-free zone in the South Pacific. It is also an active member of the Nuclear Suppliers Group and other export control arrangements.

In the nuclear security realm, Australia's track record is also impressive. It is party to the Convention on the Physical Protection of Nuclear Material and its 2005 amendment, along with all other nuclear governance conventions. It has consistently been rated number one by the Nuclear Threat Initiative in the

Australian Prime Minister Malcolm Turnbull (fourth from left), French President Emmanuel Macron (second left) and other officials visit the Australian submarine HMAS Waller in Sydney in May 2018 when France was still planning to sell submarines to Australia. That deal has now been upended by the AUKUS arrangement.
(Photo by Brendan Esposito - Pool/Getty Images)

annual Nuclear Security Index and has enthusiastically contributed to continuing efforts to strengthen nuclear security resulting from the four nuclear security summits between 2010 and 2016.

One might imagine, then, that if any country were to become the first non-nuclear-weapon state to acquire nuclear-powered submarines, Australia's would be the safest pair of hands. Indeed, some have argued that Australia could use its submarine acquisition plan to strengthen global nuclear governance. Better Canberra than Brasilia or, at worst, Tehran. Even so, the implications for the nonproliferation regime are far-reaching, overlapping, and complex.

Disturbing the Nonproliferation Zeitgeist

The NPT and the collection of other treaties, arrangements, and organizations that compose the nonproliferation regime do not exist in a vacuum, but are profoundly affected by states' attitudes, perceptions, and actions. As a nonproliferation "white knight," Australia's announcement that it is considering acquiring nuclear-powered submarines in partnership with two nuclear-weapon states portends a further roiling of the political atmosphere around a regime that is already being buffeted by numerous gales. The worst of those include the ongoing noncompliance cases of Iran and North Korea; the absence of India, Israel, and Pakistan from the NPT; the continuing nonfulfillment of undertakings by the nuclear-weapon states-parties to the NPT to achieve nuclear disarmament; the modernization and expansion programs of almost all of the states with nuclear weapons; the decades-long lack of progress at the Conference on Disarmament, especially in negotiating a fissile material cutoff treaty; and the non-entry into force of the Comprehensive Test Ban Treaty. The AUKUS submarine proposal will undoubtedly be added to this litany of woes at the 10th NPT review conference, originally scheduled for 2020 but now deferred to 2022 due to the COVID-19 pandemic.

It is not that anyone suspects Australia of seeking nuclear weapons through the backdoor of nuclear submarine propulsion, but rather that the idea reeks of the hypocrisy that has always plagued a regime built on the premise of a more or less eternal divide between nuclear haves and have-nots. Unlike the IAEA Statute, which envisaged no military use of nuclear material, the NPT carved out an exception for non-explosive military use, apparently at the suggestion of Italy, with U.S. and Soviet acquiescence.

The United States nonetheless has consistently refused to provide nuclear-propulsion technology to non-nuclear-weapon states, including to allies such as Canada, South Korea, and reportedly Japan, due to proliferation concerns. It has now made an exception for Australia as an exclusive member of the "Anglosphere," whatever that means for three increasingly multicultural societies. Australia itself carved out an exception to its policy of not supplying uranium to non-NPT parties by doing a deal with India, a state with nuclear weapons that from the outset sought to undermine the treaty. The constant chipping away at the fundamentals of the nonproliferation regime, especially by erstwhile champions, can only increase cynicism and undermine confidence in its longevity.

Setting Unsettling Precedents

If the AUKUS project is realized and assuming that Brazil, which is building its own nuclear-powered submarines, does not get there first, Australia will become the first non-nuclear-weapon state to acquire a nuclear-powered submarine. The precedent will be set, paving the way for other states to demand similar capability, either as a legitimate defense asset or as cover for more alarming nuclear ambitions, such as nuclear weapons development. Unlike Australia, some of the states that have expressed interest in nuclear-powered submarines, including Brazil and South Korea, also wish to enrich their own fuel. Exhibit A on this list is Iran, which has long argued implausibly that it needs to enrich its own uranium for peaceful purposes, notably its Tehran Research Reactor and Bushehr nuclear power plant, currently supplied by Russia, but has now added nuclear-powered submarines to its list.

Australia would set another precedent by becoming the first state to take advantage of the "loophole" in comprehensive safeguards agreements that permits nuclear material for a non-explosive military purpose to be removed from safeguards for the duration of that use. If Australia chooses the military-to-military option whereby the reactor and its HEU fuel are supplied by the U.S. or UK navies and returned to their control when the submarine is decommissioned, it might be assumed that there will be no requirement for removal or reapplication of safeguards because the material will

originate from, remain in, and return to military use. Yet, allowing a non-nuclear-weapon state to import HEU outside of safeguards in this manner would make a mockery of the entire nonproliferation regime.

Fortunately, Australia's safeguards agreement, like all others, requires that it notify the IAEA of its intention to acquire nuclear material for a non-explosive military purpose and help devise suitable verification arrangements with the IAEA to ensure that the material is not diverted to nuclear weapons. In working with the IAEA on this challenging task, Australia would be setting a precedent, for good or ill, that other states will be able to exploit. The sensitivity of the technology and the inaccessibility of the reactor to inspectors preclude a traditional approach. Instead, new approaches and methods will have to be devised to satisfy the IAEA that no diversion of nuclear material to weapons purposes takes place, while protecting confidential, proliferation-sensitive information .

Australia has already notified IAEA Director-General Rafael Grossi of its intentions and signaled its willingness to work with the agency, presumably along with the United States and the UK, to craft suitable arrangements. Grossi has responded publicly by noting that verification will be "very tricky."[4] For Australia itself, the situation may become even trickier. Under the strengthened safeguards system that Australia has long championed, the IAEA accords a state the broader conclusion when it is able to certify that, based on the information available to it, it has accounted for all nuclear material within the state. Just how this conclusion could be reached after Australia's nuclear-powered submarines have begun operating, especially at sea, is unknown. Australia has insisted that the IAEA should not automatically reissue the broader conclusion for states without reassessing their current circumstances, as occurred for Libya when civil war prevented the agency from ensuring the continuity of safeguards in its territory. Australian officials will undoubtedly work in good faith with the IAEA to craft an effective arrangement to ensure verifiability to the extent possible, but there is an element of moral hazard for Australia. It may succeed in making the world "safe" for the proliferation of nuclear-powered submarines in the hands of non-nuclear-weapon states.

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A final precedent relates to nuclear security. The Australian project would see the acquisition of HEU by a non-nuclear-weapon state at a time when the United States and others, including Australia, are attempting to minimize global holdings of HEU, including by converting reactors to using low-enriched uranium (LEU) and repatriating HEU to the United States or Russia for disposition. Although the nuclear material in submarine reactors is relatively secure, albeit nonstationary, the use of HEU for naval propulsion by a country that has been HEU free goes against the grain of the impressive efforts in recent years to ensure that nuclear material does not fall into the hands of terrorists or other nonstate actors. Some observers have suggested that Australia use LEU for its submarines, perhaps in collaboration with France, which uses such fuel. This may assuage French fury at the cancellation of its contract to build Australia's conventional submarines, whose design paradoxically was to be based on French nuclear-powered submarines at Canberra's insistence. IAEA verification, however, would become more challenging because LEU-fueled submarines, at least those using existing technology, require periodic refueling.

Going Quietly Into the Deep?

Despite an opinion poll indicating immediate domestic support for the AUKUS announcement, there remains significant public skepticism in Australia about the use of nuclear energy for any purpose. It remains to be seen whether this will shift as the 18-month study proceeds, details emerge, and the political, diplomatic, military, economic, nonproliferation, security, and opportunity costs become clearer. Although the opposition Labor Party has felt it politically expedient to support the AUKUS announcement, this is conditional on nonproliferation concerns being assuaged. A general election is due within a year. The Australian nuclear-powered submarines could be destined to go the way of Canada's. In the meantime, the AUKUS partners need to explain how they propose to deliver the gold standard safeguards, transparency, verification, and accountancy measures they have promised.

ENDNOTES

1. See Tariq Rauf and Marie-France Desjardins, "Opening Pandora's Box? Nuclear Powered Submarines and the Spread of Nuclear Weapons," *Aurora Papers*, no. 8 (1988).

2. "Joint Leaders Statement on AUKUS," Prime Minister of Australia, September 10, 2021, https://www.pm.gov.au/media/joint-leaders-statement-aukus.

3. "Message to the Congress Transmitting the Australia-United States Peaceful Nuclear Technology Transfer Agreement," *Public Papers of the Presidents of the United States, William J. Clinton, 1999*, Vol. 2 (Washington: U.S. Office of the Federal Register, 1999), pp. 1963–1965.

4. See John Carlson, "IAEA Safeguards, the Naval 'Loophole' and the AUKUS Proposal," Vienna Center for Disarmament and Non-Proliferation, October 8, 2021, https://vcdnp.org/wp-content/uploads/2021/10/Safeguards-and-naval-fuel-JC-211008.pdf; Laura Rockwood, "Naval Nuclear Propulsion and IAEA Safeguards," *Federation of American Scientists Issue Brief*, August 2017, https://uploads.fas.org/media/Naval-Nuclear-Propulsion-and-IAEA-Safeguards.pdf

Francois Murphy, "AUKUS Submarine Deal 'Very Tricky' for Nuclear Inspectors—IAEA Chief," Reuters, September 28, 2021.