

# AUKUS Pillar 1: The “Optimal Pathway” for Nuclear-Powered Submarines

Only six countries in the world, all of them nuclear-armed, have nuclear-powered attack submarines. Under AUKUS Pillar 1, Australia is set to join this exclusive club as the seventh member, and the only one to not possess nuclear weapons.<sup>1</sup>

The conventionally-armed, nuclear powered submarines (SSNs) that are a part of the AUKUS headline initiative have marked differences from diesel-powered attack submarines (SSKs). SSKs, the submarines that were a part of Australia’s original submarine deal with France’s Naval Group, have a distinct disadvantage in that they must resurface periodically to allow their batteries to recharge—an operation known as “snorting.”<sup>2</sup> In comparison, SSNs’ nuclear-powered batteries need only be recharged about every fifteen years and only need to surface as crewmembers require it, enabling them to take on longer-range missions. SSNs are also much faster than SSKs. With these advantages, SSNs can both chase and run from targets, while SSKs must wait for targets to come into range.<sup>3</sup> One of the first tasks for AUKUS partners was determining how to best achieve Australian SSN acquisition.

The “The AUKUS Nuclear-Powered Pathway: A Partnership for the Future” or “Optimal Pathway” for short, announced in March 2023, was developed by the AUKUS Pillar 1 Joint Steering Group over the course of 12 meetings between December 2021 and February 2023 and is the result of a trilateral study assessing methods through which Australia can acquire SSNs as quickly as possible.<sup>4</sup> Australia will ultimately receive SSN-AUKUS, a trilaterally-developed SSN. The receipt of SSN-AUKUS will begin in phases meant to both allow the necessary time for its development and ensure Australia is capable of its operation and maintenance.<sup>5</sup>

In this phased approach, the United Kingdom and United States will increase port visits to Australia with their own fleets beginning in 2023 and 2026, respectively, to increase Australian familiarity in hosting and maintaining SSNs.<sup>6</sup> The United States and United Kingdom will also

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<sup>1</sup> Sam Roggeveen, “How Nuclear Subs Could Transform Australia, Its Alliance and Asia,” *The Interpreter*, September 16, 2021,

<https://www.lowyinstitute.org/the-interpreter/how-nuclear-sub-could-transform-australia-its-alliance-asia>.

<sup>2</sup> Sylvia Pfeifer, Demitri Sevastopulo, and Anna Gross, “The Nuclear Technology Behind Australia’s AUKUS Submarine Deal,” *The Financial Times*, September 19, 2021,

<https://www.ft.com/content/aa5c9fd5-891b-4680-b3c7-5a55d03f673c>.

<sup>3</sup> Hugh White, “SSN vs SSK,” *The Interpreter*, September 29, 2021,

<https://www.lowyinstitute.org/the-interpreter/ssn-vs-ssk>.

<sup>4</sup> “The AUKUS Nuclear-powered Submarine Pathway: A Partnership for the Future,” *UK Government*, March 2023,

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1142588/The\\_AUKUS\\_nuclear\\_powered\\_submarine\\_pathway\\_a\\_partnership\\_for\\_the\\_future.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1142588/The_AUKUS_nuclear_powered_submarine_pathway_a_partnership_for_the_future.pdf).

<sup>5</sup> Ibid.

<sup>6</sup> “Australia’s Nuclear-Powered Submarine Capability,” *Australian Government*, March 2023, <https://www.asa.gov.au/sites/default/files/2023-06/Pathway-Factsheet.pdf>.

initiate the Submarine Rotational Force-West (SRF-West) as early as 2027 at HMAS Stirling, a military base in Western Australia. This fleet will consist of a rotational presence of one UK Astute class SSN and up to four US Virginia class SSNs.

SSN-AUKUS is expected to be delivered to Australia by the early 2040s, and the period between rotational presence and Australian autonomous SSN acquisition, or the ‘submarine gap,’ will be augmented by the United States. The United States will sell Australia three Virginia class SSNs with the potential to sell an additional two if needed, beginning in the early 2030s. This provision was authorized by the US Congress in the 2024 National Defense Authorization Act (NDAA), which passed in December 2023.<sup>7</sup> The commonality in design features of American SSNs and the future SSN-AUKUS, including similarities in propulsion plant, combat system, and weapons, will further enhance interoperability among AUKUS partners.<sup>8</sup> The 2024 NDAA also authorizes “the maintenance of US submarines by Australians in Australia,” authorizes “Australian contractors to train in US shipyards to support development of its own industrial base,” and establishes “a mechanism for the United States to accept funds from Australia to lift the capacity of the submarine industrial base.”<sup>9</sup>

Two of the major goals of the Optimal Pathway are to establish Australia as a **nuclear steward** and to make this capacity **sovereign ready**. This stewardship “describes the responsible planning, operation, application and management of nuclear material, technology and facilities. As Australia will be a non-nuclear weapon state with a naval nuclear propulsion capability, stewardship will also include the implementation of appropriate safeguard arrangements as agreed between Australia and the International Atomic Energy Agency (IAEA), in consultation with AUKUS partners.”<sup>10</sup>

“**Sovereign ready** is an important milestone on this Pathway. It refers to the point at which Australia has the ability to safely own, operate, maintain and regulate a sovereign conventionally-armed, nuclear-powered submarine capability... Australia’s target date for achieving the ‘sovereign-ready’ milestone is the early 2030s, enabling it to acquire its first Virginia class SSN” from the United States.”<sup>11</sup>

The full Optimal Pathway document is available here for download:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file)

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<sup>7</sup> “Passage of Priority AUKUS Submarine and Export Control Exemption Legislation by the United States Congress,” *Australian Ministry of Defence*, December 15, 2023, <https://www.minister.defence.gov.au/media-releases/2023-12-15/passage-priority-aucus-submarine-and-export-control-exemption-legislation-united-states-congress>.

<sup>8</sup> “FACT SHEET: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines,” *The White House*, March 13, 2023 <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/13/fact-sheet-trilateral-australia-uk-us-partnership-on-nuclear-powered-submarines/>.

<sup>9</sup> “Passage of Priority AUKUS Submarine and Export Control Exemption Legislation by the United States Congress.”

<sup>10</sup> “FACT SHEET: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines.”

<sup>11</sup> Ibid.

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