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WILL SOUTH KOREA ACQUIRE NUCLEAR SUBMARINES? IT'S NOT CERTAIN

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The recent US decision to approve South Korea's possession of nuclear-powered submarines may shift the balance of power on the Korean Peninsula and affect Asian peace and security generally. South Korean nuclear submarines could accelerate the arms race in Asia and impact geopolitical relations beyond Asia. They may undermine the Nuclear Nonproliferation Treaty (NPT) and international norms and agreements discouraging the spread of advanced weapons systems. Both the United States and South Korea should reflect on these concerns before proceeding.

President Trump met South Korean President Lee Jae-myung during his late October 2025 trip to South Korea for APEC. In addition to new trade agreements, the White House said Trump approved South Korean requests to build nuclear-powered attack submarines and the United States agreed to work closely with South Korea on this project, including avenues to acquire nuclear fuel. On his *Truth Social* platform, Trump stated that the submarines would be constructed in a former US shipyard in Philadelphia now run by the South Korean conglomerate Hanwa. "I have given them approval to build a nuclear-powered submarine, rather than the old-fashioned, and far less nimble, diesel-powered submarines that they have now," Trump's Truth Social posting stated.

Geopolitical, technological, and strategic considerations

South Korea has been interested in developing nuclear-powered submarines for a long time. With the threat of North Korea's stockpile of nuclear weapons and missile delivery vehicles, South Korea feels that increased naval strength could act as an offset and perhaps minimize reliance on the US "nuclear umbrella."

South Korea currently operates 21 conventional submarines, including three ballistic missile submarines, with its older submarines purchased from Germany. Since the early '90s South Korean submarines have been built in the Daewoo and Hyundai shipyards in South Korea under license from Germany. Approximately half of South Korean submarines use some form of air independent propulsion (AIP). Conventional submarines use AIP to stay submerged for protracted periods, such as 30 days, without needing to surface or snorkel. The Republic of Korea Navy (ROKN) has a long-term expansion plan to expand its conventional submarine force. Since 2017 the ROKN has looked at arming new attack submarines with Tomahawk-like cruise missiles and considered building prospective KSS-3 attack submarines with nuclear power plants.

South Korea may be driven to acquire nuclear submarines by the vessels' perceived military prestige. They may also view nuclear-powered submarines as a potential counterbalance to North Korea's nuclear weapons. However, compared to conventional AIP submarines, the main advantage of nuclear-powered attack submarines is speed. Conventional AIP attack submarines can carry the same weapons systems as the far more expensive nuclear-powered submarines. Joining the United States, United Kingdom, France, Russia, India, and potentially Brazil (with its indigenous program) and Australia (via the joint AUKUS program) would put South Korea in a prestigious group. Yet at the same tme, it might increase the desires of North Korea, Pakistan, Japan,

and even Iran to expedite their expressed interests in nuclear-powered submarines.

Although South Korea's interest in nuclear submarines is quite high, non-nuclear submarine options might work best for Seoul. In addition, despite little current interest, South Korea might be better served by an AUKUS-like agreement with the United States or perhaps a leasing arrangement like that used by India to acquire nuclear submarine technology. India leased two nuclear-powered submarines, the first from the Soviet Union and the second from the Russian Federation.

South Korea has the technology to build naval propulsion reactors. Technical guidance from the United States, such as reactor core designs, would be helpful but not necessary. South Korea might look to follow the French and Chinese examples, which use low enriched uranium (LEU) as reactor fuel. These fuels may be a better option for South Korea instead of following the US/UK model of using weapons-grade highly enriched uranium (HEU) fuel or the Russian and Indian use of HEU in the range of 40% to 60% enrichment fuel.

South Korea should carefully consider the impact that nuclear-powered submarine construction could have on escalating an arms race with North Korea. North Korea will certainly view any such efforts as a provocation by South Korea as well as the US and may respond in ways that upset the regional balance of power. China could have serious concerns and react negatively to the South Korean plan, and Japan might also worry about elevating conflict possibilities in the region.

The impact on global norms and the NPT

As a non-nuclear weapons state (NNWS) under the NPT, South Korea is allowed to use what in International Atomic Energy Agency (IAEA) parlance is "special fissile material for military purposes" that are not related to nuclear weapons. It is also allowed under the NPT to enrich uranium.

However, materials within South Korea must still be under safeguards and the IAEA has yet to develop a safeguards methodology to deal with material in NNWSs, such as Brazil, that are put into military use. An additional question is whether US support of NNWS nuclear-powered submarines will be viewed as undercutting and weakening the NPT. China, Russia, and their partners will argue that it does.

US support of nuclear-powered submarines, either in Australia or South Korea, may weaken US safeguards and nonproliferation efforts. For the United States, doing so will need to be a risk-benefit calculation. The addition of nuclear-powered submarines in Australia and South Korea may provide some counterbalance to China's growing People's Liberation Army Navy. But it is unclear if these benefits will outweigh the risks of undercutting nonproliferation efforts and weakening the NPT.

Barriers to actual construction

The use of the old US Navy shipyard in Philadelphia to build South Korea nuclear-powered submarines seems to be a non-starter, or at least a difficult path. It has never been a nuclear shipyard, and it would be necessary to acquire all the permits and technological expertise to make the Philadelphia shipyard nuclear capable. It would undoubtedly, even if pushed hard by the Trump administration, take years before the yard could be approved to begin construction.

So, it appears likely that any construction of South Korean nuclear-powered submarines would be in South Korea, where submarine construction capable shipyards could add staff and expertise to carry out nuclear construction.

A second potential barrier would be the US' current 123 agreement with South Korea (one of 26 such agreements the United States has with specific countries for civil nuclear cooperation under Section 123 of the US Atomic Energy Act). Transfer of fuel materials and potential transfers of technology to South Korea would require its modification. The current agreement only focuses on peaceful uses and there could be an internal US political battle over modification of the current South Korean 123 agreement. While 123 agreements are negotiated by

the Department of State, Congress effectively blocked a previous 123 effort in Saudi Arabia.

While these barriers may be overcome under the current US administration, the US 2026 midterm elections or subsequent US elections might result in reversals of any decisions made now on these issues.

Conclusions

South Korea's acquisition of nuclear-powered submarines is a complex issue that involves a range of technical, strategic, and geopolitical considerations. Acquiring nuclear-powered submarines could enhance South Korea's defense capabilities, particularly in terms of deterrence against North Korean nuclear threats, but it would also require substantial investments in technology, infrastructure, and training. In addition, the geopolitical implications could be far-reaching, affecting South Korea's relations with North Korea, China, Japan, and the United States in addition to weakening international norms and diminishing the strength of the Nuclear Nonproliferation Treaty.

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