APLN

ASIA-PACIFIC LEADERSHIP NETWORK

The Korea Times

GROWING UNDERWATER NUCLEAR AMBITIONS IN ASIA PACIFIC

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4 November 2026

Since the advent of nuclear-powered vessels, nuclear and maritime security have been closely intertwined. The introduction of nuclear-powered ballistic missile submarines (SSBNs) has further complicated the relationship. An increasing number of countries rely on SSBNs to maintain credible second-strike capabilities, the foundation of nuclear deterrence.

The proliferation of nuclear-powered attack submarines (SSNs) adds another layer of complexity. SSNs are often regarded as effective platforms for countering SSBNs, given their stealth capabilities in the underwater domain. Indeed, one of the primary motivations for countries, including those without nuclear weapons, to acquire SSNs is their "hunter-killer" capability, which enables them to counter underwater threats and maintain a favourable balance of power in the maritime domain and in an escalation dominance scenario.

Yet an SSN fleet capable of tracking an adversary's SSBNs can create pressures that may escalate a crisis amongst nuclear-armed states.

The Asia-Pacific region has become a focal point for the growing interconnectedness of the nuclear and maritime security domains. Beyond nuclear-weapon states such as the United States and China, key U.S. allies, including Australia and South Korea, have already announced plans to acquire SSNs. North Korea has gone further, supposedly unveiling what it claims is a "nuclear-powered strategic guided missile submarine." Unlike Australian or South Korean SSNs, such a vessel is intended to carry nuclear weapons, which could alter the region's underwater balance of power.

Despite the growing importance of the underwater-nuclear relationship in the Asia-Pacific, existing scholarly and policy analyses of this topic largely predate developments such as South Korea's SSN decision and the latest Chinese and U.S. fleet changes. A new volume by the Asia-Pacific Leadership Network (APLN), titled "Underwater-Nuclear Nexus in the Asia-Pacific: Nuclear-Powered Submarine

Proliferation and Its Consequences," published with support from the Heinrich Böll Foundation, addresses this gap.

Bringing together contributions from seven regional experts, the volume examines a wide range of security challenges arising from the intersection of the nuclear and maritime domains, with a particular focus on underwater security. These challenges encompass both traditional and emerging security concerns. The volume uses the term "underwater-nuclear nexus" to conceptualise this relationship, highlighting the growing strategic significance of interactions between these two domains and underscoring the need for an integrated approach to addressing the risks. The volume is freely available on the APLN website.

The report is organized around three broad themes: first, the development of nuclear-powered submarines and anti-submarine warfare (ASW) capabilities in Australia, Japan and South Korea; second, U.S.-China competition in the underwater-nuclear domain; and finally, emerging issues surrounding the underwater-nuclear nexus.

Under the first theme, the volume finds that Australia and the ROK perceive the benefits of acquiring SSNs to outweigh the costs, whereas Japan has yet to reach the same conclusion. Moreover, it argues that it is critical for these nonnuclear-weapon states to establish themselves as responsible stewards of naval nuclear propulsion. The chapters examining ASW capabilities show that Australia, Japan and South Korea follow broadly similar trajectories in developing their ASW capabilities. The authors further argue that future ASW challenges extend beyond technological considerations to include personnel-related issues, particularly recruitment and retention.

Turning to U.S.-China competition in the underwater-nuclear domain, the authors examine and compare the two countries' development of SSNs and assess the command-and-control arrangements governing Chinese SSBNs. The volume finds that although the United States currently maintains an advantage in SSN capabilities, China is rapidly narrowing the gap. Regarding command-and-control, the volume explores the dilemma Beijing faces between maintaining tight, centralized political control over its SSBNs and delegating greater authority to submarine commanders. Delegation could enhance the survivability and credibility of China's sea-based nuclear deterrent, but it also raises the risk of unauthorised or accidental nuclear use.

On emerging concerns surrounding the underwater-nuclear nexus, the volume finds that the proliferation of nuclear-powered submarines in the Asia-Pacific could increase environmental risks. Although these vessels have historically maintained a strong safety record, nine nuclear-powered submarines have sunk in the world's oceans.

Emerging technologies are also reshaping the underwater domain. For instance, advances in quantum technologies could transform underwater detection and navigation capabilities, potentially increasing the vulnerability of nuclear-powered submarines to adversary detection. These developments could exacerbate security dilemmas amongst

countries operating nuclear-powered submarines and heighten "use-it-or-lose-it" pressures during a crisis, particularly if a state fears that the survivability of its sea-based nuclear deterrent is at risk.

The maritime domain has become an increasingly important dimension of the nuclear picture, as shown by the proliferation of SSNs and SSBNs, along with the associated risks. The expansion of nuclear-powered submarine fleets in the region should therefore not be viewed solely through a single country's nuclear strategic perspective or exclusively through the lens of maritime security. Existing regional security dialogue platforms, such as the ADMM-Plus and the ASEAN Regional Forum, could consider developing common submarine safety measures and incident management protocols.

As a future SSN operator with a strong stake in regional stability, South Korea is well placed to take a leading role in convening these discussions. Forums such as the Seoul Defense Dialogue and the Jeju Forum could provide valuable opportunities to initiate such discussions. As more nuclear-powered submarines enter the region's waters, that conversation cannot wait.

The opinions articulated above represent the views of the author(s) and do not necessarily reflect the position of the Asia-Pacific Leadership Network.

This commentary was originally published in the Korea Times, and on the APLN website.

ABOUT APLN

The **Asia-Pacific Leadership Network (APLN)** is a Seoul-based organisation and network of political, military, diplomatic leaders, and experts from across the Asia-Pacific region, working to address global security challenges, with a particular focus on reducing and eliminating nuclear weapons risks. The mission of APLN is to inform and stimulate debate, influence action, and propose policy recommendations designed to address regional security threats, with an emphasis on nuclear and other WMD (weapon of mass destruction) threats, and to do everything possible to achieve a world in which nuclear weapons and other WMDs are contained, diminished, and eventually eliminated.

