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Toward Stealth and Sea Denial: Submarine Modernization in East Asia

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Synopsis

An important aspect of the regional "arms competition" in East Asia is the gradual introduction of new classes of conventionally-powered diesel-electric submarines (SSKs), which are increasingly becoming "platforms of choice" - as force-multipliers in diverse missions as well as against superior forces.

Commentary

Notwithstanding East Asia's economic growth rates and deepening integration into the global economy, the region's strategic realities reflect contending trajectories. As China expands its national interests in the broader context of "new historic missions", it seeks to regain a great power status and reassert its geopolitical role in the region. As a result of China's accelerating military modernization, regional powers are responding by revamping their force modernization priorities, alliances, and overall strategic choices.

The economic, political, and military rise of China, embedded in three decades of relentless Chinese economic growth, has propelled progressive modernization of the Chinese military with major improvements in virtually every capability domain.

China's Naval Modernization and Submarine Expansion

Notwithstanding weaknesses and limitations in capabilities integration, China's PLA Navy (PLAN) is gradually transforming toward a regional [blue water] defensive and offensive type navy with extended so-called anti-access/area-denial (A2/AD) capabilities, limited expeditionary capabilities, and corresponding defensive and offensive air power. China calls its comprehensive A2/AD strategy a "counter-intervention", which is interpreted as denying the U.S. and its allies the freedom of action in China's 'near seas' by restricting their deployments into theatre (anti-access) and denying them freedom of movement there (area denial).

An important aspect of China's multilayered strategy is the gradual introduction of new classes of submarines – both nuclear and conventional. China is currently operating as many as 45 submarines structured in six different classes: two classes of indigenously designed diesel submarines, including the *Song class* (Type 039) and the *Yuan-class* (Type 041), and four nuclear classes that include the *Shang-class* (Type 093), *Jin-class* (Type 094) nuclear powered ballistic missile submarines (SSBN) and the follow-on Type 095 nuclear-powered attack submarine (SSN) and *Tang-class* (Type 096) SSBN.

Since 2004, China is believed to have launched 12 Type 041 *Yuan-class* conventional submarines, which have been progressively modified to carry more advanced high-frequency sonar, upgraded weapons systems, noise reduction and air independent propulsion (AIP) technologies. The PLA Navy may procure up to 20 additional *Yuan-class* submarines based on technologies imported from Russian boats. Since the mid-1990s, China has procured as many as 12 *Kilo-class* submarines from Russia, and is reportedly negotiating the purchase of at least four fourth-generation *Amur (Lada)-class* or possibly a fifth-generation *Kalina-class*, both featuring advanced AIP systems.

Regional Responses

In Northeast Asia, Japan and South Korea are prioritizing the procurement of new types of submarines. In September 2013, South Korea launched a fourth 1,800 ton *Son Won-ill class* (German Type 214) submarine, featuring AIP and combat management systems. South Korea now operates 13 submarines: nine Type 209 *Chang Bogo* and four *Son Won-ill class* submarines. Meanwhile, in October 2013, the Japan Marine Self Defense Force (MSDF) launched its newest submarine the *Kokuryu* – the sixth of planned ten *Soryu class* boats first commissioned in 2009. With its range, endurance, sensors, weapons load and other systems, including the Stirling AIP propulsion system and Harpoon anti-ship missiles, the *Soryu class* is regarded as the most advanced in Japan's conventional submarine fleet of 16 submarines.

In Southeast Asia, the relatively high acquisition costs and maintenance requirements have traditionally precluded a quantitative diffusion of submarines. However, the recent introduction of more capable coastal diesel-powered submarines provides unprecedented capabilities. Most recently, Vietnam received two of six *Kilo-class* (Project 636) diesel-electric submarines from Russia in 2013- 2014, designed for diverse reconnaissance and patrol, anti-submarine and anti-ship missions.

Indonesia, Malaysia, and Singapore are also planning to expand or upgrade their submarine fleets. From 2007-09, Malaysia took formal delivery of two French-built *Scorpene-class* submarines, equipped with underwater-launched *Exocet* anti-ship missiles. Both submarines are based at the Kota Kinabalu Naval Base in Sabah, East Malaysia, indicating their primary mission to protect Malaysia's sovereignty in part of South China Sea. Meanwhile, Indonesia has ambitious plans to expand its submarine fleet to at least six, and ideally to 12 by 2024, a key element in the "Minimum Essential Force" (MEF) and declared goal of developing a 'green-water' navy. In 2012, the Indonesian Navy (TNI-AL) announced a US$1.1 billion contract for three Type-209/1400 diesel-electric submarines, constructed by South Korea's Daewoo Shipbuilding and Marine Engineering.

In November 2013, Singapore announced a contract with German shipbuilder ThyssenKrupp to acquire two advanced *Type-218SG* submarines that will augment existing Archer-class boats and replace ageing ex-Swedish *Challenger-class* by 2020. Type-218SG, designed for littoral, shallow sea operations, is a customized design that will integrate features from Type 214 and possibly Type-216 'concept submarine' fitted with fuel-cell AIP system.

Strategic Ramifications

Over the past decade, the operational utility of submarines in East Asia has widened: from anti-submarine warfare to force protection such as close submarine escort missions, intelligence surveillance, and reconnaissance (ISR), support of Special Forces, and other complementary deterrence and defensive tasks supporting territorial defense. At the same time, the introduction of submarine-launched anti-ship and land-attack cruise missiles, anti-submarine sensors and weapons, as well as air independent propulsion systems have increased their stealth capacity to remain undetected shortened their target-identification-and-attack cycle, and ultimately, improved their flexibility, mobility, endurance, reach, and lethality.

For smaller, defensively-oriented navies in East and Southeast Asia, these attributes enable "sea-denial" capabilities aimed at preventing an opponent from using the sea, rather than providing a degree of sea control to use the sea for own power projection. Submarines will therefore become an increasingly valuable strategic asset in the region, particularly with installed AIP systems. The key difference, however, will be in the experience, training, and skill set of its operators.

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