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Prospects of North Korean Naval Nuclear Deterrent Forces

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North Korea's ballistic missile and thermonuclear tests of 2017 are not the only ones on a list of potential threats. It is also mastering technologies necessary for nuclear deterrent forces based in part on submarines. This new qualitative threat requires closer cooperation between the U.S., South Korea, and Japan in missile defence and anti-submarine warfare.

The unprecedented number of ballistic missile and thermonuclear tests in 2017 by North Korea has demonstrated the rapid progress with which it is building up its nuclear arsenal. While the U.S. administration's focus has been on North Korea's successful recent launches of intercontinental ballistic missiles (ICBMs), no less attention should be paid to the North's efforts to enhance its naval arsenal, necessary for credible deterrence.

The North's Strategy. Even though important parts of North Korea's nuclear strategy remain undeclared and unknown, some conclusions about them can be drawn from analyses of its developed capabilities. Despite international sanctions, as well as other financial and technical barriers, the country is following a path trodden by others, especially the Soviet Union and China. North Korea's ambitions are to have relatively small but reliable nuclear deterrent forces. For them to be credible, they must be based on higher chances of survival of first nuclear or conventional strikes and the capability to retaliate with a second strike. To achieve this, the North needs a diverse arsenal of nuclear and thermonuclear warheads to guarantee retaliatory strikes on U.S. bases in Asia and even on American continental megacities. Such an arsenal also could deter the U.S. from any attempt to disrupt North Korea's nuclear and missile programmes. It already has a huge conventional arsenal deployed for potential use against U.S. forces and cities in South Korea, and it probably has nuclear warheads deployed on medium and intermediate ballistic missiles also targeting Japan and Guam. Moreover, in 2017, North Korea conducted three successful tests of two ICBM models that might pose a threat to continental U.S. cities, especially when armed with more powerful thermonuclear warheads.

North Korea's Development of Ballistic Missiles. The so-called Rumsfeld Panel, appointed by the U.S. Congress in 1998, analysed potential missile threats to America from Iraq, Iran, and North Korea. Its report indicated the threat of a simple and cheap option in which missiles would be deployed on board a commercial ship that could make its way close to the territory of the continental U.S., removing the need for an ICBM. Indeed, North Korea could still use this option for a covert first strike, but it would result in inevitable nuclear retaliation by the U.S. In this context, a more optimal solution for North Korea to increase its chances of survival is through an arsenal of ICBMs and submarines as a platform for sea-launched ballistic missiles (SLBMs). In 1992, North Korea purportedly obtained plans for the Soviet-era SLBM R-27/SS-N-6, with a liquid fuel engine and a range of 4,000 km, although later Russia denied this and stressed that Pyongyang had shown during parades only mock-ups and had never tested this missile. The R-27 was also a model for the Musudan, a land-based intermediate ballistic missile with a range of 2,500–3,500 km, which became the basis for a few other missile types in North Korea and Iran. However, most of the nine tests of a series of Musudans in 2016–2017 ended in failure.

Faced with problems with the Musudan, the North's rapid progress on new missiles based on solid-fuel engines shows a parallel success with more sophisticated technology. These new fuel and engine types have advantages over the older Scud or Musudan missiles, which require a long time to fuel, making them vulnerable to pre-emptive strikes. North Korea's progress with SLBM and solid fuel was illustrated by the more than a dozen tests of the PK-1/KN-11 missiles since 2014, first from static land launchers and then from a submersible launch barrage, and later from a new submarine. This missile is also visually similar to the Soviet R-27 but has a completely different engine and fuel, resulting in speculation about possible aid from Iran, Pakistan, or China. Equally surprising was a test in spring 2017 with a visibly enlarged modification of the PK-1, this time as a land-based, mobile medium-range missile called the PK-2/KN-15 (both models may have a range well above 1,000 km). All this shows that the North in a period of a few years has mastered solid fuel technology for its first SLBM. This technology was not deployed by the Soviet Union on its SLBMs, but China introduced it with its JL-1 SLBM in 1982, and Russia only in 2011, with its RSM-56 Bulava. North Korea's success with solid fuel and the PK-1/2 missile family are opening the way to further armament with more dangerous and survivable land missiles, the development of future and more advanced ICBMs, as well as work on an SLBM with a greater range than the PK-1.

Submarine Fleet. North Korea's first modern submarine with an SLBM is already in service and in this regard, it might be ranked just after those of the five recognised nuclear powers and India. Lacking appropriate reactors, North Korea cannot build a nuclear-powered submarine, and so is limited to conventional units. To develop the latter, North Korea has had much experience copying models from China and with building its own small and midget submarines. Of great importance to its research and development of an SLBM platform were a few post-Soviet Golf II-class submarines it gained in 1993. Russia intended them to be scrapped and transferred them without SLBM launchers (three in each vessel), but they were used by the North Koreans to study the technology. At the same time, it bought other post-Soviet subs, Whiskey and Foxtrot-class units, which gave its access to other technical solutions and spare parts for its submarine fleet, dominated by 1950s generation models. With two decades of effort, North Korea was able to effectively modernise and enlarge its fleet to 70–72 submarines, as well as to start indigenous development of an SLBM platform. The Sinpo-class submarine is the first North Korean unit with a single missile launcher, and probably was rolled out in 2014. It is an experimental unit to prove general concepts and SLBM launch techniques but during a real military crisis it might be relatively easy to detect, follow, and destroy it.

Similar to the Golf II-class subs in the USSR and China, the Sinpo-class unit could be an introduction to a next generation and class of submarines with SLBMs. The reconfiguration of its home shipyard suggests that North Korea is working on these—probably much larger—vessels, with 2–3 or 3–4 launchers for SLBMs. A model that can carry and launch missiles with greater range could give North Korea second-strike capabilities, especially if undersea engine noise can be reduced. Gaining these capabilities are crucial for North Korea's deterrence ambitions, so it is not surprising news that it stole plans for a new South Korean KSS III-class submarine, which might also be a platform for SLBMs. Despite barriers associated with its submarines' non-nuclear power plants, it should be expected that in the next few years, a successor (or successors) to the Sinpo-class generation may be able to reach targets in South Korea, Japan, Guam, and Hawaii. In the context of the deployed land PAC or THAAD ballistic missile systems, this kind of submarine will give opportunities to North Korea to strike from a completely different direction than expected and away from early warning radars. However, less probable are prospects that an SLBM-capable Northern Korean submarine could prowl the coast of the U.S.

Conclusion. Contrary to opinions about the irrationality of the Pyongyang regime, it wants first and foremost to have a relatively diverse nuclear arsenal, which would guaranty it the capability to retaliate after a nuclear or conventional pre-emptive strike by the U.S. The North Korean nuclear deterrence is aimed at a dyad, composed of a land element (mobile ICBMs) and a sea element (submarines with SLBMs), because there is no chance for indigenous or foreign long-range bomber airplanes. The North's expected capabilities cannot compare to the under-sea deterrent forces of the five largest nuclear powers. Nevertheless, North Korea's situation is similar to the first phase of development of nuclear forces in China, beginning with its position as an isolated, poor, and technologically under-developed state. In terms of submarines with SLBMs, North Korea must achieve indigenous conventional engine solutions, to some extent comparable to the first and second generations of Soviet submarine platforms, and with information from the technological plans stolen from South Korea. Even if North Korea had only a few such submarines, that could change the military situation in the region, complicating military planning of the U.S. and its allies (especially first strikes). This threat would require much more inter-operability than exists between the missile-defence and anti-submarine warfare systems now at the disposal of the U.S., Japan, and South Korea. Also, the growing demand in Asia for U.S. missile-defence systems—Aegis, THAAD and PAC—might limit their availability to U.S. forces and allies in Europe.