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**Research Report**

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# SWP Comment

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## Maritime Nuclear Deterrence

Submarine-Launched Ballistic Missiles in the South China Sea

*Michael Paul*

China has a modest nuclear deterrent in terms of cost and scale, compared to the United States and Russia. Beijing does not strive for the ability to conduct nuclear wars, but rather seeks to deter aggression at a low level with a secure second strike capability. In contrast to its rapid conventional armament, China has in the past modernized its nuclear weapons systems only slowly and in small numbers. It apparently does not strive for equality with the nuclear weapons capability of the US or Russia and wants to avoid a symmetrical arms race. Recently, however, the Chinese leadership has been pursuing an increasingly ambitious policy of asymmetric nuclear armament. Land-based, long-range ballistic missiles are being deployed in a mobile mode and equipped with manoeuvrable multiple warheads; hypersonic weapon systems are being developed, and submarines are now also being equipped with strategic nuclear weapons. New missiles can reach the US, even if launched from the South China Sea. Deploying nuclear weapons on submarines requires a great deal of effort, poses complex challenges and involves high costs. Why did China choose this solution and may it represent a turning point in the development of its nuclear strategy?

The Indo-Pacific region is attracting increasing attention because the US's ability to project global power is coming under particular pressure there. Due to its maritime armament, China has become the largest naval force in East Asia and is questioning the regional supremacy of the United States. In the new US security strategy, China and Russia are explicitly referred to as revisionist powers, as 'antitheses' of American values and interests. China is accused of wanting to oust the US from the Indo-Pacific region and taking the lead globally. The new great power rivalry between the US and China is primarily

conducted at diplomatic and economic levels as well as in the cyber and the information space, but can lead to military and, therefore, nuclear escalation.

Unlike Moscow, Beijing has not defined its relationship with Washington in terms of nuclear equality or even parity. The reason for this is not only a fundamentally different security situation, but also a different nuclear philosophy. Still mindful of the 'century of humiliation' (1839 – 1949), China is keen to acquire the latest weapon technology in order not to fall behind again (and thus into the danger of renewed humiliation). But to strive for parity would



require an enormous financial effort due to the different balance of power compared to the US and Russia, which would come at the cost of social peace in the country – and thus of regime stability. Nuclear weapons therefore have an important but limited significance for China’s foreign and security policy.

Mao Tse-tung is often quoted as saying that the atomic bomb is only a “paper tiger”. But the country’s Communist leadership has never underestimated the importance of nuclear weapons. In the dialectical sense, these weapons were, from their point of view, paper as well as real tigers: paper if you do not fear them and real if you do not have them. Foreign powers were able to control China using the threat of nuclear weapons, something Beijing could not accept – not least due to the memory of the “century of humiliation”. Mao recognised the issue of possessing nuclear weapons as one which determined China’s fate.

Mao’s demand that nuclear weapons be available only in small numbers but of high quality became the official guideline of China’s deterrence policy in the 1960s and is still valid today. A statement by Major General Peng Guangqian in 2004 made it clear what considerations Beijing links with this approach to a lean and effective weapons arsenal: Even if the US were capable of destroying China a hundred times, his country would still be victorious if it succeeded in doing so once.

The deterrent effect of nuclear weapons is absolute and cannot be replaced by other weapons, said President Xi Jinping in his first speech as General Secretary of the Communist Party of China to officers of the “Second Artillery” of the People’s Liberation Army (PLA) on 5 December 2012. Since its foundation on 1 July 1966, this unit of the land forces has been responsible for the management of the nuclear weapons arsenal. In the 2015 White Paper, the nuclear force is referred to as the “cornerstone” on which national sovereignty and security are based. The increased importance of the missile armed forces is illustrated by them being upgraded to a separate branch on 31

December 2015 – the PLA Rocket Force (PLARF). However, due to the high degree of secrecy, foreign experts are still undecided as to whether the PLARF or the PLA Navy are responsible for missiles on strategic submarines.

## Principles of China’s nuclear strategy

The tautological statement about the defensive nature of its own nuclear strategy (“a self-defensive nuclear strategy that is defensive in nature”) is typical for official statements about the Chinese military strategy in general. Ambiguity and vagueness, which often characterize official declarations, are intended because, with a much smaller arsenal of weapons compared to the US and Russia, ambiguity is an element of deterrence – and even the relatively detailed US doctrine does not outline all the relevant circumstances of its nuclear operations.

Mao had recognised that nuclear weapons could exert political influence on his country. Possessing nuclear weapons was definitely an issue that determined China’s sovereignty and was therefore indispensable. In developing nuclear weapons and determining the parameters for their use, Beijing is still guided by the principle of the necessary minimum of retaliation, which consequently also includes the policy of No First Use (NFU).

Ever since the first nuclear weapons test on 16 October 1964, China has always declared that it would never and under no circumstances be the first to use nuclear weapons. This decision may also have been the result of tactical considerations. However, as a Maoist legacy, the commitment to NFU has since shaped both declaratory policy and arms procurement policy. Most recently, it was officially reaffirmed in the 2015 White Paper. However, it is unclear under which conditions nuclear weapons would be used.

In principle, every nuclear weapon state must protect its own nuclear weapons from

a disarming first strike, but they must not be used prematurely in the event of an alleged or actual threat of first strike. In order to react to a first strike, there are essentially two possibilities, being discussed in the US since 1960s: namely to launch nuclear weapons as soon as a warning is issued by satellite (Launch on Warning) or after the attack has been confirmed by an explosion (Launch under Attack). If enemy missiles are fired from submarines, theoretically, a decision must be made within a few minutes whether or not to launch one's own missiles. However, due to the vulnerability of nuclear weapon control facilities, it may be too late to give the order to start strategic bombers or missiles. In the US and Russia, strategic nuclear weapons are therefore constantly kept on high alert so that they can be launched within a few minutes. A false alarm could, therefore, in a crisis trigger a nuclear war 'by accident', even though no attack has taken place. If, however, nuclear weapons are held back too long, there is a risk of their loss and intra-war deterrence becoming a failure.

Chinese policymakers face a similar dilemma today. On the one hand, NFU policy suggests that nuclear weapons will only be used after a long period of military conflict, in which China's armed forces are in danger of being completely destroyed or the state and party leadership is facing complete collapse. On the other hand, it is conceivable that cyber attacks combined with the use of conventional weapons (Conventional Prompt Global Strike, CPGS) in a counterforce strike might destroy key components of the Chinese command system and missile arsenal. The US's missile defence system, with support from allies in the region, could then intercept the remaining Chinese missiles and thus destroy Beijing's second-strike capability. Of course, this scenario requires Washington to be willing to take a significant risk. Beijing must, however, ensure the security of its country even under extreme conditions. In both scenarios, no nuclear weapons were used: should now nuclear weapons be used first?

## China's nuclear weapons arsenal

There are no official figures on China's nuclear arsenal. China has relatively few nuclear weapons and therefore does not want to disclose the precise number. Western research institutes estimate the number of operational nuclear weapons at 175 to 190. In addition, there is a reserve, so a total of up to 270 nuclear weapons is assumed. Quantitatively, China ranks fourth among the five officially recognised nuclear weapons states – in order of the size of their nuclear arsenals, they are Russia, the United States, France, China and the United Kingdom.

Nevertheless China has the world's largest arsenal of ballistic missiles. These are mainly conventional short-range missiles. Their strategic launch vehicles are land-based medium-range and intercontinental ballistic missiles; China also has 48 Submarine-Launched Ballistic Missiles (SLBMs). Bombers have so far played a secondary role. In 2017, however, Beijing announced the construction of new strategic bombers (allegedly armed with ballistic missiles). In contrast to the US and Russia, China does not (yet) have a comparably robust triad of land, air and sea-based strategic deterrence systems. This makes the vulnerability of most of the triad – its land-based systems – all the more critical.

### Focus on land-based ballistic missiles

Land-based ballistic missiles are the preferred carrier system for nuclear weapon states because they are technically the simplest and most cost-effective. They are the main component of China's deterrent arsenal. Firmly bunkered in silos, however, they make an easy target for enemy disarmament strikes. Mobile launchers therefore make the better carrier systems. These are generally road and all-terrain vehicles, but also include rail-mounted transport vehicles.

But tremendous advances in sensor technology, resolution, data acquisition and

data transmission, now even make mobile missiles hidden on land more detectable than ever before. Moreover, in the past, only land-based ballistic missiles were considered capable of destroying enemy missiles, as they are always kept on high alert and have great accuracy. Nowadays, a Trident SLBM of the US Navy even has a higher probability of hitting and destroying bunkered targets. As a result, hundreds of additional warheads are available for counterforce strikes, bringing into question the deterrence capability of potential US opponents, at least in important parts.

### **Approaches to increasing the survivability of China's nuclear weapons**

There are several ways to increase the survivability of nuclear weapons and thus the credibility of deterrence. The simplest method is to artificially fortify stationing sites such as silos, aircraft hangars and submarine bases or to use natural protection. For example, China hides long-range missiles in tunnel systems throughout its mountain regions. In addition, the procurement of a sufficient number of warheads and the availability of different carrier systems can ensure redundancy. Furthermore, in China's case, the size of the country and the breadth and depth of the sea provide simple protection. China's submarine-launched missiles can best meet the two criteria for greater survivability in the event of an attack, namely redundancy and diversification.

### **Characteristics and consequences of sea-based systems**

Sea-based nuclear weapons systems are of paramount importance for safe second-strike capability and thus for ensuring nuclear deterrence. As early as June 1958, China therefore decided to build submarines to carry nuclear weapons. The US and Russia served as prestigious role models, having launched the first nuclear sub-

marines (the *USS Nautilus* and *Leninsky Kom-somol*) some years earlier. After Moscow had denied the Communist leadership in Beijing further technological support, the project became a matter of national honour. Mao said that China would build nuclear submarines, even if it took 10,000 years. A difficult economic situation, shortcomings in the production infrastructure and political events meant that the project was repeatedly interrupted. A suitable submarine wasn't produced until 1981 which was followed by the successful test flight of an SLBM of the type "Ju Lang" (JL). These missiles served as a model for the current JL-2 (CSS-NX-14) SLBM with a range of up to 7,200 kilometres.

China has constructed various nuclear-powered submarines since 2002: in addition to attack submarines, four SLBM-armed (SSBN) Jin class (Type 094) submarines, each capable of carrying 12 JL-2 missiles. These boats are stationed at the Yulin naval base on Hainan. Further submarines are planned. Type 094B submarines are to be equipped with JL-2A SLBMs with a range of 11,200 kilometres and would thus be able to reach the US without having to leave the protection of their naval base in the South China Sea. By the early 2020s, third-generation SSBNs (type 096) are to be equipped with JL-3 SLBMs which will also have an intercontinental range.

This will significantly change the threat situation for Washington. So far, around 20 Chinese intercontinental ballistic missiles would be capable of reaching the US. Now 48 SLBMs will be added, the number of which can grow from a total of six submarines up to 72 missiles with nuclear warheads (and so far these are still only single warheads and not up to eight multiple warheads, as are common in US and Russian SSBN fleets).

According to the Pentagon, the four Jin boats represent "China's first credible maritime nuclear deterrent". But the Chinese leadership is facing a volatile mix of problems if it wants to secure this maritime deterrent: The high operating noise of Chinese boats makes it easier for the enemy

to locate the submarine and thus to hunt it. More than 50 years after the first launch, Chinese submarines are still as noisy as Soviet submarines of the 1970s. China must therefore continue to work on the development of quieter engines. In addition, it has barely made any progress in acquiring Anti-Submarine Warfare (ASW) capabilities compared to those of the US: In particular, the PLA lacks the ability to coordinate its own submarine hunters beyond the “first chain of islands”. However, this may be a deliberately chosen restriction due to the geo-strategic focus on the area within the first chain of islands. This area also includes the Yellow Sea, bordered by Korea and Japan, the western part of the East China Sea with Taiwan and the South China Sea.

Strategic submarines must be permanently armed on patrol in the Pacific or Indian Oceans if they are to ensure second-strike capability in the event of a conflict, but should not become an easy target for enemy naval aviation in the relatively clear marginal seas of the Pacific. However, if Beijing chooses this solution, the China’s Central Military Commission would have to transfer responsibility for the use of nuclear weapons to naval officers (and presumably accompanying political officers) on board, and ensure trouble-free communication over long distances. Just navigating such a submarine (called a ‘boomer’ in the US) with its large and complex operating and weapons systems requires constant practice with a well-trained crew. In addition, the Chinese Navy has no experience with long patrols under realistic operational conditions and, presumably, the submarine on the longest patrol mission to date (95 days) was not armed with operational missiles. In this respect, the patrols of the 094 submarines primarily serve to test crews and material before future strategic submarines take on the task of credibly guaranteeing China’s maritime nuclear deterrence in the oceans of the world – probably in Arctic and Indo-Pacific operational areas.

## **A ‘bastion’ for Chinese submarines in the South China Sea**

As soon as Chinese submarine commanders want to head for the Pacific, they have to pass through transit routes that are monitored by the US Navy and allied forces. The South Fleet is currently responsible for protecting China’s strategic missile submarines that operationally covers the South China Sea with its headquarters in Zhanjiang. In contrast, the Yellow Sea is relatively shallow with an average depth of only 46 metres, so in the language of submariners it is a flooded meadow.

The bastion concept is similar to the Soviet Navy’s approach during the Cold War. The Red Fleet also tried to evade the ASW capabilities of the US and its allies due to the loud operating noises of its boats by visiting a shelter controlled by its own armed forces in the Sea of Okhotsk. If they wanted to leave the Pacific Rim Sea, Soviet submarines – like the Chinese today – were all the more vulnerable because the Kuriles were the hunting grounds of US and Japanese anti-submarine units.

In China’s case, the South China Sea offers effective protection. As part of the Western Pacific, this largest and deepest marginal sea in the world is bordered to the north and west by the continental margin of the Asian mainland mass (China and Vietnam) and to the south by the Malay Peninsula and Borneo. In the east, the Philippine island chain separates the South China Sea from the Pacific Ocean. Although just over half of all shelf areas have depths of less than 200 metres, the central deep-sea plain has an average water depth of 4,100 metres, with the deepest being in the southern Manila Trench at more than 5000 metres. The Strait of Luzon connects the South China Sea with the Pacific Ocean between Taiwan and Luzon with a width of 380 kilometres and a depth of 2,600 metres (see map, p. 6).

The first 094-type strategic Jin submarine is already based in the underground submarine bunker of the Yulin Marine Base, located southeast of Sanya City on Hainan

Map

China's "Island Chains"



Island. The other four Jin submarines are also based there. Presumably, the next generation of submarines launched in the early 2020s and equipped with JL-3 SLBMs, will initially be based there too. The larger range of the JL-2A SLBMs already allow missiles launched from 094B-type submarines to reach destinations in the US from this region. So it is no coincidence that China reacts particularly nervously to US ships going on reconnaissance voyages near the outposts claimed by Beijing and the transit routes in this area. In December 2016, for example, the Chinese Navy confiscated an

underwater drone from the USNS Bowditch near Scarborough Reef, which had been recording oceanographic data. Ultimately, Beijing not only wants its maritime deterrence, but also its denial strategy (Anti-Access/Area Denial, A2/AD) to be secured in this area.

In the future, satellites are to ensure "total, uninterrupted surveillance" of the sea and shipping traffic, in order to obtain "effective information for China to manage and control the South China Sea". This will improve the range of capabilities of Chinese outposts which use their sensors and effec-

tors to act on enemy aircraft and ships, thus not only trying to deter US forces from intervening (e.g., to protect Taiwan), but also protecting submarines on patrol. Contrary to international law and the ruling of the arbitral tribunal in The Hague in July 2016, China continues to maintain its claim to control up to 86 percent of the South China Sea. Outposts around the Spratly Islands (Chinese: Nansha) have been fortified so much they are now referred to as ‘island fortresses’. As a particularly striking sign of China’s claim to ownership of the South China Sea, the expansion of these military infrastructure projects is likely to continue. After all, President Xi considers the progress made in transforming former reefs and sandbanks to be one of the most important achievements of his first years in office. As a result, some have predicted that China will gain full control of air and sea links in the Western Pacific over the next decade.

Strategic submarines, however, will only be stationed in the South China Sea temporarily. Chinese submarines are still too noisy to find protection in the open sea and to present a credible nuclear deterrent. For reasons of national prestige and in line with the legacy of Mao, China will in the future want to send its strategic submarines out on patrol in the world’s oceans, just like the US and Russia. Given the remarkable progress made in recent years, this is only a matter of time.

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