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China's Nuclear Inventory: Capabilities and Possibilities

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Cover Photo: Cong Fu, Director-General of the Department of Arms Control and Disarmament at the Ministry of Foreign Affairs of the People's Republic of China, addresses the general debate of the Tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. UN Photo/Loey Felipe.

CHINA'S NUCLEAR INVENTORY: CAPABILITIES & POSSIBILITIES

EXECUTIVE SUMMARY

The ongoing Russia-Ukraine war has sparked fears over Russia resorting to nuclear weapons (if at all) to secure victory over Ukraine. Are there 'red lines' that are limiting Russia's nuclear option? While the Russia-Ukraine War has re-affirmed the rationality of nuclear deterrence theory—that nuclear weapons are an effective tool for deterrence—interestingly, it has also brought to the surface an important question: What happens when a state's contingency based irrational behavior raises the scenario of a credible nuclear threat?

For instance, since the start of the war in February 2022, Russian President Vladimir Putin has threatened to deploy nuclear weapons against anyone attempting to intervene and has subsequently put the nation's arsenal on high alert. Furthermore, on 21 February 2023, Putin announced the suspension of the implementation of the New START agreement with the US—thus, heightening the nuclear threat.

In drawing a corollary to the Russia-Ukraine War, China becomes a case in point given the increasing speculation over China's pending invasion of Taiwan. In drawing lessons from Russia, will China, too, resort to nuclear blackmail? This becomes an important question. Thus, it is imperative to understand China's nuclear policy which for long remained in a 'vulnerable state' but now, retaining its "no-first-use" policy, sees China increasingly modernizing and expanding its nuclear inventory. In addition, China has also upgraded its force structure from Second Artillery Force

(SAF) to that of People's Liberation Army Rocket Force (PLARF), which is heavily invested in modernizing its nuclear forces by enhancing its silo-based intercontinental ballistic missiles (ICBMs) and adding more survivable mobile delivery systems.

These changes highlight a shift, with the PRC moving from minimum deterrence towards limited deterrence—thus, raising red alarms. In addition, the Russia-Ukraine War and North Korea's expanding nuclear ambitions have compounded growing concerns over nuclear aggression.

Given the lack of transparency over China's nuclear capabilities and its future plans for modernization, this policy brief discusses China's expanding nuclear inventory by assessing its capabilities, threat perceptions, force structure, and the likely implications of these changes.

INTRODUCTION

In its recent Annual Report to Congress (2022) on the *Military and Security Developments Involving the People's Republic of China* (PRC), the US Department of Defense highlighted two key aspects of China's nuclear capabilities:

First, per estimates, the PRC's operational nuclear warheads stockpile has surpassed 400. Second, if China continues with the pace of its nuclear expansion, it is likely to have a stockpile of about 1,500 warheads by 2035, the timeline by which the Chinese military plans to "basically complete modernization".¹

In addition, recently *The Wall Street Journal* reported that on 26 January 2023, the US military has notified the Congress that "[t]he number of land-based fixed and mobile ICBM

¹ U.S. Department of Defense, *Military and Security Developments Involving the People's Republic of China 2022*, p. IX, at: <https://media.defense.gov/2022/Nov/29/2003122>

launchers in China exceeds the number of ICBM launchers in the United States.”²

Table 1: China’s Nuclear Stockpile

| | |
|---------------------------------------|--|
| Land-based ballistic missiles | <i>DF-4; DF-5A/B; DF-21A/E; DF-26, DF-31; DF-31A; DF-31A(G); DF-41</i> |
| Submarine-launched ballistic missiles | <i>JL-2</i> |
| Bomber | <i>H-6</i> |
| Cruise missile | - |

In 2021, open-source satellite imagery noted ICBM silo fields under construction in north-western China.³ It is anticipated that, when complete, these fields could (if fully filled) accommodate hundreds of ICBMs and bring the number of China’s operationally deployed land-based strategic nuclear launchers much closer to parity with those of Russia and the United States.⁴

These developments make it imperative to focus attention on the scale and pace of Beijing’s nuclear force expansion and modernization.

PRC’s ‘Defensive’ Nuclear Policy & Nuclear Doctrine

With its testing of a nuclear bomb in 1964, the People’s Republic of China (PRC) emerged as the fifth official nuclear weapon state after the United States, the Soviet Union (now Russia), United Kingdom, and France. Owing to its nuclear status, the PRC’s nuclear strategy

entails two key pledges: that China “would not be the first to use nuclear weapons at any time and under any circumstances and that it would unconditionally refrain from using or threatening to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones.”⁵ In its defensive orientation, PRC’s nuclear policy pledged for minimum deterrence under a strategy of “assured retaliation”.

China’s perception of the ‘use’ of nuclear weapons has been predominantly shaped by two perspectives: deterring a nuclear attack and preventing nuclear coercion—evinced by China’s ‘no-first-use policy’. The 2006 Defense White Paper articulates the PRC’s national defense policy as:

Pursuing a self-defensive nuclear strategy. China’s nuclear strategy is subject to the state’s nuclear policy and military strategy. Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China. China remains firmly committed to the policy of no first use of nuclear weapons at any time and under any circumstances. It unconditionally undertakes not to use or threaten to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones, and stands for the comprehensive prohibition and complete elimination of nuclear weapons. China upholds the principles of counterattack in self-defense and limited development of nuclear weapons, and aims at building

² Quoted in Michael R. Gordon, “China Has More ICBM Launchers Than U.S., American Military Reports”, *The Wall Street Journal*, 7 February 2023, at: <https://www.wsj.com/articles/china-has-more-icbm-launchers-than-u-s-american-military-reports-11675779463>

³ For details see, Matt Korda and Hans Kristensen, “A Closer Look at China’s Missile Silo Construction”, *Federation of American Scientists*, 2 November 2021, at:

<https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/>

⁴ IISS, *The Military Balance 2022*, London: Routledge.

⁵ Embassy of the People’s Republic of China in the Republic of Serbia, “Position Paper of the People’s Republic of China At the 66th Session of the United Nations General Assembly”, 09 September 2011, at: http://rs.china-embassy.gov.cn/eng/xwdt/201109/t20110909_3346397.htm

a lean and effective nuclear force capable of meeting national security needs. It endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force. China's nuclear force is under the direct command of the Central Military Commission (CMC). China exercises great restraint in developing its nuclear force. It has never entered into and will never enter into a nuclear arms race with any other country."⁶

The 2019 Defense White Paper reiterates NFU by positing that:

China pursues a nuclear strategy of self-defense, the goal of which is to maintain national strategic security by deterring other countries from using or threatening to use nuclear weapons against China."⁷

It is argued that the PRC's nuclear doctrine, like other nuclear weapon states, has five elements: declaration, nuclear development, nuclear deployment, nuclear employment, and nuclear disarmament.⁸ In aligning with its defensive nuclear posture, China is focused on: maintaining a second-strike capability and deploying and maintaining the capability of nuclear retaliation—an effective force. To note, until now, China has not deployed nuclear weapons outside of its borders.

PRC'S NUCLEAR CAPABILITIES & FORCE STRUCTURING: MOTIVATIONS & INTENTIONS

In understanding the expanding nuclear capabilities of any state, one must ask: Is it for security or for global status? Applying this logic, China's increasing nuclear stockpile can be seen to be motivated by two factors. First, maintaining a credible deterrence against other nuclear-armed states with which it is in conflict, mainly the United States and India. And second, to improve its global standing as a powerful country with a strong nuclear deterrence. While there is no conclusive evidence to suggest that China is aiming for nuclear weapons parity with the United States and Russia, such an intention cannot be ruled out in assessing China's nuclear modernization program.

What is evident is a shift from minimum deterrence, which was once the preferred strategy of the PRC. Now, China's nuclear force structure is exhibiting signs of adopting a more advanced nuclear posture of 'limited deterrence'. In Alastair Iain Johnston's words, limited deterrence, as per Chinese strategists, "requires sufficient counterforce and countervalue tactical, theater, and strategic nuclear forces to deter escalation of conventional or nuclear war. If deterrence fails, this capability should be sufficient to

⁶ Information Office of the State Council of the People's Republic of China, "China's National Defense in 2006", December 2006, at: <http://www.china.org.cn/english/features/book/194421.htm>

⁷ The State Council of the People's Republic of China, "Full Text: China's National Defense in the New Era", 24 July 2019, at: https://english.www.gov.cn/archive/whitepaper/201907/24/content_WS5d3941ddc6d08408f502283d.html

[01907/24/content_WS5d3941ddc6d08408f502283d.html](https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967)

⁸ Liping Xia, "China's Nuclear Doctrine: Debates and Evolution", Carnegie Endowment for International Peace, 30 June 2016, at <https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967>

control escalation and to compel the enemy to back down.”⁹

Owing to this, the expanding nature of China’s nuclear inventory can be explained under two perspectives: First, the fluctuations in its force size and structure over time are the result of changing calculations of what constitutes a credible minimum deterrence. Second, the changing security environment and the increasing external threats that China faces is propelling the shift. In Xi Jinping’s definition, China’s security environment has “Three Trends” and “Three Major Dangers” states that:

The “Three Trends” exemplify the external environment, the international situation that is constantly changing, and new opportunities and challenges that are continually emerging, while the “Three Major Dangers” are those of China being “invaded, toppled and separated.”¹⁰

Furthermore, its increasing nuclear stockpile also suggests that the long-standing Chinese policy of maintaining a small and survivable nuclear deterrent is no longer satisfactory for a rising China. This nuclear weapons build-up is not just linked to deterrence but also to enhancing China’s great-power status. Calling it a “firm shield”, *Science of Military Strategy 2013* states:

The influence of nuclear weapons on the molding of a nation’s great-power status and international prestige, as well as on state-to-state relations, is something difficult to achieve with other types of weapons. Nuclear weapons have always played the role of a pillar for China’s great-power status, and hereafter will remain important marks and symbols clearly displaying China’s international position.¹¹

To add, as Deng Xiaoping had stated, additional nuclear force enhancements were necessary “to earn more say and a higher international status in a coming world order”¹², providing the impetus to China’s nuclear modernization since the 1980s. Hence, the aim is to build an effective and capable force that guarantees deterrence.

This also explains PRC’s intention in upgrading its Second Artillery to that of PLA Rocket Force. The 2019 White Paper makes two significant mentions:¹³ First, the PLARF “plays a critical role in maintaining China’s national sovereignty and security”. Second, owing to strategic requirements, the PLARF “is enhancing its credible and reliable capabilities of nuclear deterrence and counterattack, strengthening intermediate and long-range precision strike forces, and enhancing strategic counter-balance capability, so as to build a strong and modernized rocket force.”

⁹ Alastair Iain Johnston, “China’s New “Old Thinking”: The Concept of Limited Deterrence”, *International Security*, 1995-1996, 20 (3), pp. 5-6.

¹⁰ Sun Jianguo, “Upholding the Chinese Approach to National Security”, China Institute of International Studies, 11 June 2015, at: http://www.ciis.org.cn/english/2015-06/11/content_7983173.htm

¹¹ Project Everest, *The Science of Military Strategy 2013* Translated by China Aerospace Studies Institute, US Air University, 2 February 2021, p. 290, at: <https://bit.ly/3SSmwee>

¹² Quoted in Susan Turner Haynes, “The Power of Prestige: China’s Nuclear Developments”,

Conference-Draft Paper for Presentation at the ISA Annual Convention Atlanta, March 2016, pp. 1-2, at:

https://www.academia.edu/23440377/The_Power_of_Prestige_Chinas_Nuclear_Developments_The_Power_of_Prestige_Chinas_Nuclear_Developments

¹³ The State Council of the People’s Republic of China, “Full Text: China’s National Defense in the New Era”, 24 July 2019, at:

http://english.www.gov.cn/archive/whitepaper/201907/24/content_WS5d3941ddc6d08408f502283d.html

Furthermore, in expounding the role of PLARF, *Science of Military Strategy 2020* states as “the core strength of the PRC’s nuclear deterrence, it is a strategic support for the PRC’s status as a major power, and it is an important cornerstone for safeguarding national security.”¹⁴

PLARF’s functional objectives of the missile forces still adhere to the directions of the SAF, as the 2015 White Paper categorically notes.¹⁵

First, strive to transform itself in the direction of informationisation, press forward with independent innovations in weaponry and equipment by reliance on science and technology, enhance the safety, reliability, and effectiveness of missile systems, and improve the force structure featuring a combination of both nuclear and conventional capabilities.

This upgrading for force status to PLARF highlights the increasing importance of conventional and nuclear missiles to the PLA’s war-fighting and deterrence capabilities. That is, on a conventional level, developing missile capabilities provides the PLA more options in planning for regional scenarios such as a Taiwan invasion, or a conflict in the South China Sea, East China Sea, or the Korean Peninsula; while on the strategic level, the PLARF provides greater credibility to China’s nuclear deterrence.¹⁶ As argued, the PLARF is not just a “provider” of key military capabilities but it has become a “potential source of coercive leverage” for Beijing and also acts as a

“visible symbol” of China’s great-power status.¹⁷

To put it simplistically, for PRC, nuclear weapons are vital to China’s dealing with its security environment and to have its rightful position in the global order. Thereby, security and status go hand-in-hand.

WHAT ARE THE POSSIBILITIES?

In 1947, Mao Zedong characterized nuclear weapons as “paper tigers”, but when China was testing its own first nuclear bomb in 1964, Mao explained:

It is possible for our country to produce a few atom bombs, but we are not going to use them. Why would we want to produce them if we are not going to use them? We will use them as defensive weapons. Currently, some big nuclear powers, the U.S. in particular, scare people with nuclear bombs...The people of the world all oppose to the use of nuclear bombs to kill.¹⁸

While Zhou Enlai stated:

Only when we possess strategic missiles and nuclear weapons can we not have to use missiles and nuclear weapons. If we don’t have missiles, imperialism surely will use missiles.”

What is evident from the sentiments of Mao Zedong to Xi Jinping is that China’s nuclear weapons policy remains the same: nuclear weapons are not a means for fighting or winning wars. This is well-founded in China’s

¹⁴ Quoted in Andrew S. Erickson (2023), “China’s Approach to Conventional Deterrence”, in Roy D. Kamphausen (ed.) *Modernizing Deterrence: How China Coerces, Compels, and Deters*, Seattle, WA and Washington DC: The National Bureau of Asian Research, p. 15.

¹⁵ The State Council of the People’s Republic of China, “China’s Military Strategy”, 27 May 2015, at:

http://english.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm

¹⁶ Amrita Jash, “PLARF: China’s 21st Century Rocket Army”, *Scholar Warrior*, Spring 2019, p. 75.

¹⁷ Michael S. Chase, “PLA Rocket Force Modernization and China’s Military Reforms”, The RAND Corporation, 15 February 2018, p. 1.

¹⁸ Quoted in Zhenqiang Pan, “A Study of China’s No-First-Use Policy of Nuclear Weapons”, *Journal for Peace and Nuclear Disarmament*, 1(1), p. 121.

12-point position paper on the “Political Settlement of the Ukraine Crisis”, which categorically states:

Nuclear weapons must not be used and nuclear wars must not be fought. The threat or use of nuclear weapons should be opposed. Nuclear proliferation must be prevented and nuclear crisis avoided.¹⁹

Similarly, in alignment with his predecessors, Xi Jinping responded to the heat-up over the deployment of nuclear arms in the Russia-Ukraine War, by positing that:

The international community should [...] jointly oppose the use or threats to use nuclear weapons, advocate that nuclear weapons must not be used and nuclear wars must not be fought, in order to prevent a nuclear crisis in Eurasia.²⁰

In analysing China’s current posture, what is certain is that China's nuclear modernization program is introducing substantial new capabilities even while its overall nuclear posture remains defensive.

These qualitative advancements might affect Chinese nuclear strategy and policy. Here, a key question to ask is this: Is China intending to pursue a first strike capability against all nuclear adversaries? For to achieve this ability, China needs to have enough nuclear weapons with greater precision and destructive capability. In all likelihood, the expected outcome is that China’s nuclear stockpile will increase overtime – both in terms of size and sophistication. This trend

will have direct implications, with the possible scenarios being:

First, an unbalancing of security and stability in the Indo-Pacific region, especially for countries such as the United States., Japan, and India, the three Quad countries which are either involved in or are in dispute with China over Taiwan, the South China Sea, the East China Sea, and the Himalayan border, respectively.

Second, another possible scenario can be that, taking cues from Russia (such as Putin’s nuclear threats against Ukraine), China might also use its increasing nuclear capability to coerce its adversaries to meet its desired ends. This especially holds in the context of the growing tensions over Taiwan between the United States and China.

In both the scenarios, China’s growing nuclear arsenal raises red alarms – either way, it poses a challenge to the rules-based order. However, until it achieves parity with the United States, China’s overall nuclear strategy, unlike its conventional strategy, will continue to remain consistently defensive in nature.

¹⁹ Ministry of Foreign Affairs of the People’s Republic of China, “China’s Position on the Political Settlement of the Ukraine Crisis”, 24 February 2023, at: https://www.fmprc.gov.cn/eng/zxxx_662805/202302/t20230224_11030713.html

²⁰ Xi made the statement after meeting German Chancellor Olaf Scholz in Beijing on 4 November 2022. See, “Xi urges Ukraine peace talks, warns against nuclear crisis in Eurasia in meeting with Scholz”, *Global Times*, 5 November 2022, at: <https://www.globaltimes.cn/page/202211/1278765.shtml>

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