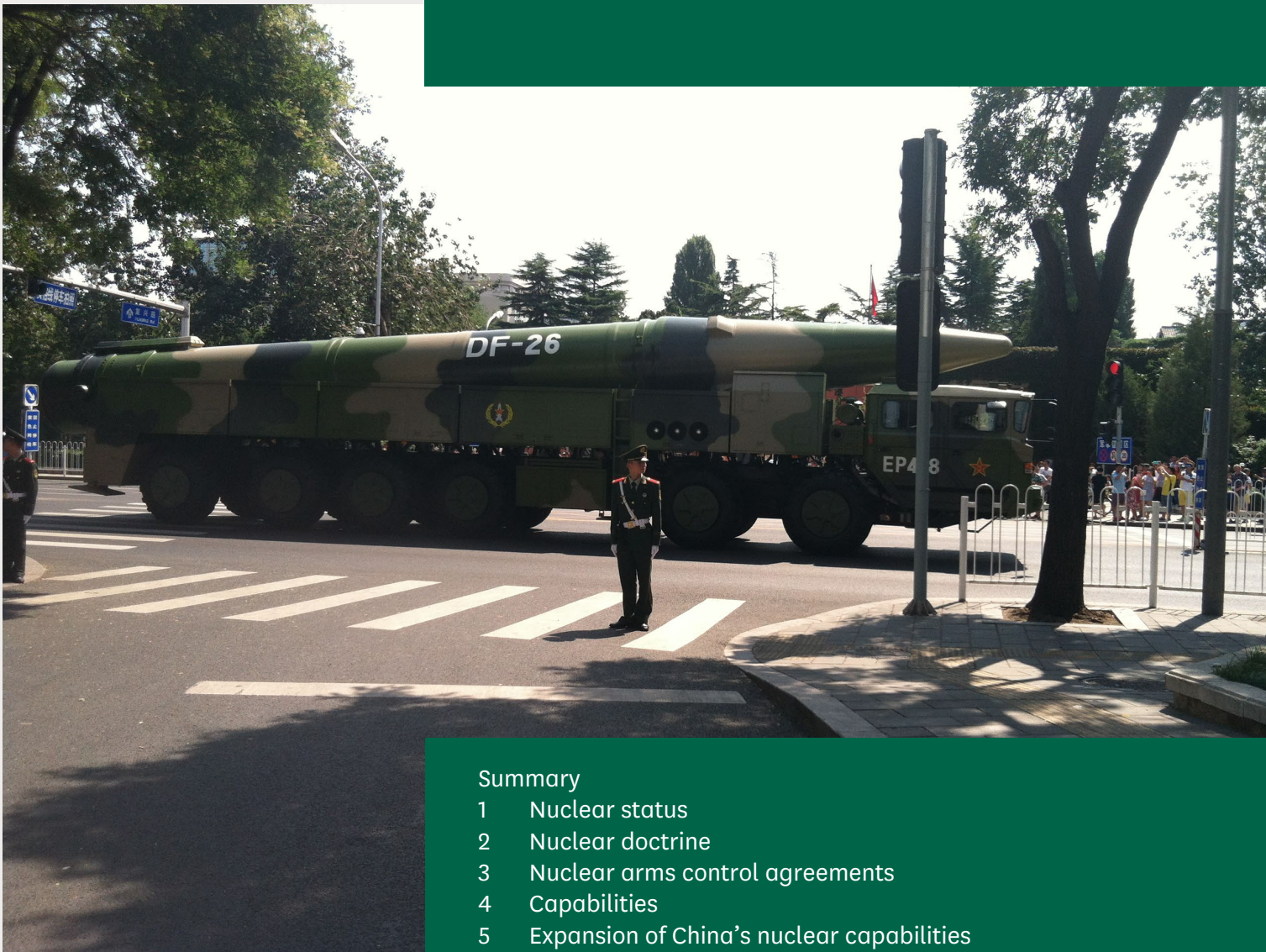


Research Briefing

29 July 2022

By Claire Mills

Nuclear weapons at a glance: China



Summary

- 1 Nuclear status
- 2 Nuclear doctrine
- 3 Nuclear arms control agreements
- 4 Capabilities
- 5 Expansion of China's nuclear capabilities

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[DF-26 medium-range ballistic missile](#) at a military parade held in Beijing to commemorate the 70th anniversary of the end of WWII by IceUnshattered – [Wikimedia Commons page](#). / image cropped. Licensed by Creative Commons Attribution-ShareAlike 4.0 International ([CC BY-SA 4.0](#)).

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Summary

Precise information on the extent of China's nuclear arsenal is difficult to obtain, due to a lack of open source information and often contradictory or exaggerated claims.

Over the last two decades China has, however, been actively expanding its nuclear capabilities in order to achieve a more robust and survivable nuclear force; at the same time as developing a credible second-strike capability.

- China's nuclear posture is based on the concept of "self-defence" and, as such, it maintains a nuclear force based on the minimum required for its national security.
- It has a longstanding no first-use policy.
- China's nuclear stockpile is estimated at 350 warheads.
- Nuclear forces are maintained at a low alert level. No warheads are thought to be operationally deployed but kept in storage under central control.
- Is believed to have a viable nuclear triad of ground, air and sea-launched forces.
- Does not operate continuous at-sea deterrence.

The extent of China's nuclear expansion has raised questions over the compatibility of its modernisation plans with its posture of self-defence and no first use.

This short paper is intended as an introduction to China's nuclear weapons policies and programmes. It is part of a series of country profiles which are available on the [House of Commons Library website](#).

1

Nuclear status

In 1955 the Chinese leadership initiated a nuclear weapons programme, partly in response to concerns about US nuclear threats during the Korean War. Nine years later, in October 1964, China successfully tested an atomic device.

China then tested its first thermonuclear (second generation) device in June 1967. Observers commented on the short time span (32 months) between the two tests, which was substantially less than the other nuclear powers.¹

Under the Nuclear Non-Proliferation Treaty (NPT) a nuclear weapon state is defined as one that manufactured and exploded a nuclear weapon, or other nuclear explosive device, prior to 1 January 1967.

Alongside the other permanent members of the UN Security Council (the P5), China is, therefore, one of the five officially recognised nuclear weapon states under the NPT.

¹ In comparison, 86 months passed between the United States' first atomic test and its first hydrogen bomb test, for the Soviet Union it was 75 months, for the UK 66 months, and for France 105 months (Nuclear Threat Initiative, [China Profile](#), April 2015)

2

Nuclear doctrine

The Chinese Government has consistently asserted that its nuclear posture is based on the concept of “self-defence” and, as such, maintains a nuclear force based on the minimum required for its national security.

China’s National Report to the 2022 NPT Review Conference states:

China adheres to a nuclear strategy of self-defence aimed at deterring others from using or threatening to use nuclear weapons against it. Accordingly, China has defined basic policies on the role, use and alert status of its nuclear weapons, the scale of its nuclear forces, and nuclear arms control that are commensurate with this purpose. In particular, China has consistently maintained its nuclear forces at the lowest level necessary for its national security, and has never competed with other countries in terms of nuclear investment, numbers or scale, participated in any form of arms race, provided a nuclear umbrella for other countries, or deployed nuclear weapons in other countries. Its nuclear weapons are exclusively strategic, and it takes an extremely cautious approach to their use.²

2.1

Declaratory policy

Successive Chinese leaders have maintained a policy of “no first use” for China. It is the only nuclear weapon state to have consistently done so and in 2021 confirmed that this position “will not change in the future”.³

The reasons why China may have adopted a policy of no first use was examined in a Nuclear Threat Initiative briefing in December 2005:

Beijing often points to its NFU policy as proof that China—in apparent contrast to the United States and Russia—is a “peace-loving” nation that is “pursuing a foreign policy of peace.” Affectation and propaganda aside, “no-first-use” was both conditioned by necessity—a small nuclear arsenal—and by policy, since China’s nuclear weapons were not meant to go beyond countervalue (i.e., city-busting) minimum deterrence. China’s NFU policy has therefore been governed less by altruism than by other limiting factors.⁴

² [Implementation of the Treaty on the Non-Proliferation of Nuclear Weapons in the People’s Republic of China: National Report](#)- (PDF), NPT/CONF.2020/41, 16 November 2021

³ [Implementation of the Treaty on the Non-Proliferation of Nuclear Weapons in the People’s Republic of China: National Report](#)- (PDF), NPT/CONF.2020/41, 16 November 2021, para.6

⁴ Nuclear Threat Initiative, ‘[Going Beyond the Stir: The Strategic Realities of China’s No-First-Use Policy](#)’, December 2005

The NTI also considered that China would have little to gain from abandoning the policy:

The NFU policy has served China well by assuring strategic stability, assisting in a relatively more efficient allocation of limited resources, and allowing Beijing to take the high moral ground on nuclear weapons use.⁵

Questions have begun to be asked, however, over the compatibility of a posture of self-defence and no first use, with the extensive programme of nuclear expansion that China is currently undertaking (see below). In its [2020 annual report to Congress on China's military capabilities](#), the US Department of Defense observed:

China has long maintained an NFU policy, stating that it would use nuclear forces only in response to a nuclear strike against China. China's NFU pledge consists of two stated commitments: China will never use nuclear weapons first at any time nor under any circumstances, and China unconditionally undertakes not to use or threaten to use nuclear weapons against any non-nuclear-weapon state or in nuclear-weapon-free zones [...]

China's lack of transparency regarding the scope and scale of its nuclear modernization program, however, raises questions regarding its future intent as it fields larger, more capable nuclear forces.

SIPRI argues, however, that “despite the continuing growth in its nuclear arsenal, China's ongoing modernization programmes do not appear to portend changes to its longstanding nuclear policies”.⁶

In January 2022 the five recognised nuclear weapon states (the P5) also issued a statement in which they affirmed that “a nuclear war cannot be won and must never be fought” and that nuclear weapons “should serve defensive purposes, deter aggression, and prevent war”.⁷

⁵ Nuclear Threat Initiative, '[Going Beyond the Stir: The Strategic Realities of China's No-First-Use Policy](#)', December 2005

⁶ SIPRI, World Nuclear Forces 2020

⁷ [Joint Statement of the Leaders of the Five Nuclear Weapon States](#), 3 January 2022

3

Nuclear arms control agreements

In its National Report to the 2022 NPT Review Conference, China set out its position on nuclear disarmament:

An active participant in international nuclear arms-control efforts, China has steadfastly advocated the complete prohibition and thorough destruction of nuclear weapons, and holds that all nuclear-weapon States should earnestly fulfil their obligations under article VI of the Non-Proliferation Treaty and publicly undertake not to seek permanent possession of nuclear weapons. Nuclear disarmament should be a just and reasonable process of gradual and balanced reduction.

States with the largest nuclear arsenals bear special and overarching responsibilities with regard to nuclear disarmament, and should continue to reduce their nuclear arsenals significantly and substantially in a verifiable, irreversible and legally binding manner in order to create conditions for the ultimate realization of general and complete nuclear disarmament. When conditions are ripe, all nuclear-weapon States should join the multilateral nuclear disarmament negotiation process.⁸

Nuclear Non-Proliferation Treaty

China ratified the NPT in 1992, after several decades outside of its architecture. Now one of the recognised nuclear weapon states under the NPT China has a legal obligation to pursue disarmament under Article VI of that treaty.

Comprehensive Test Ban Treaty (CTBT)

Although China has observed a nuclear testing moratorium since 1996 it has signed, but not ratified, the Comprehensive Test Ban Treaty.

Under Article XIV of the CTBT, China is a designated Annex 2 state whose signature and ratification is required before the treaty can enter force.

In 2019, the Head of the Chinese delegation to a conference aimed at facilitating the entry into force of the CTBT, commented:

Since it declared the moratorium in 1996, the Chinese government has all along faithfully honoured its commitment and has never wavered in its political support for the Treaty. China has actively engaged in international efforts aimed at facilitating the entry into force of CTBT. It has supported the CTBT-

⁸ [Implementation of the Treaty on the Non-Proliferation of Nuclear Weapons in the People's Republic of China: National Report](#)- (PDF), NPT/CONF.2020/41, 16 November 2021, para.15

related resolutions at successive GA sessions. I would like to reiterate that China will not be an obstacle to the entry into force of the Treaty.⁹

He also confirmed that China “has made important progress in domestic preparations for its implementation”¹⁰, a position that was reaffirmed in China’s [National Report to the 2022 NPT Review Conference](#).

In April 2020 the US State Department accused China of conducting nuclear tests “inconsistent with the zero-yield standard”.¹¹ China has, in turn, refuted the allegations suggesting that the “groundless” accusations had only been levelled by the US in an attempt to push the country into a nuclear arms control treaty with the US and Russia.¹² China has repeatedly refused to engage in discussions on a multilateral treaty, arguing that the US and Russia must first reduce their own nuclear weapons stockpiles to China’s level.

Fissile Material Cut-Off Treaty

China supports the early negotiation and conclusion of a fissile material cut-off treaty, although it is yet to declare an official moratorium on fissile material production.

Treaty on the Prohibition of Nuclear Weapons

In common with the other nuclear weapon states, China has not signed the [Treaty on the Prohibition of Nuclear Weapons](#), which entered into force in January 2021.

⁹ [Statement by H.E. Mr. Fu Cong Head of the Chinese Delegation and Director-General of the Department of Arms Control of MFA](#), 26 September 2019

¹⁰ [Statement by H.E. Mr. Fu Cong Head of the Chinese Delegation and Director-General of the Department of Arms Control of MFA](#), 26 September 2019

¹¹ US State Department, [2020 Adherence to and Compliance with Arms Control, Nonproliferation and Disarmament Agreements and Commitments \(Compliance Report\)](#)

¹² The previous Trump administration refused to extend the US-Russia New START treaty, arguing that nuclear arms control should be broadened out to include China. This is examined in greater detail in [Prospects for US-Russian nuclear arms control](#), House of Commons Library, July 2020

4 Capabilities

Although China maintains that its nuclear posture is a defensive one, it does have force projection capability, which has been greatly improved in the last few years. Motivated by the survivability and assured retaliation of its nuclear forces¹³, China is considered to have transitioned over the last few years from a small, unsophisticated and highly vulnerable nuclear force, to a more modern one that is increasingly reliable, survivable and has an improved counterstrike capability.

China's deterrent is based on the nuclear triad principle. The majority of Chinese warheads are currently believed to be intended for strategic purposes and delivered by ground-based ballistic missiles. However, in the last few years China has made significant progress in its air-launched and submarine-launched nuclear capabilities, providing what the Pentagon described in its 2020 military power report as a "viable nuclear triad".¹⁴

4.1 Stockpile

The Chinese Government has never declared the size or status of its nuclear stockpile.

As of January 2022, SIPRI estimates the Chinese nuclear stockpile to be in the region of 350 warheads, an increase of 70 warheads in the last four years alone.¹⁵

None of those warheads are thought to be operationally deployed but are "de-mated" from their delivery vehicles and kept in storage under central control.

4.2 Fissile material

Although China has not publicly declared a halt to the production of fissile material, it is widely believed to have done so.

¹³ Assured retaliation entails surviving a first strike and remaining capable of retaliating with nuclear strikes that would inflict unacceptable damage on an adversary.

¹⁴ US Department of Defense, [Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2020](#), September 2020

¹⁵ SIPRI Yearbook 2022 and Kristensen and Norris, [Chinese nuclear forces 2018](#)

China has not declared its fissile material production and there are varying estimates as to its holdings. According to one assessment published by the International Institute for Strategic Studies in 2014:

The current best estimate of the total stockpile of plutonium and HEU, including material in current warheads is 1.9 tonnes of plutonium and 19 tonnes of HEU [...] the total stockpile is sufficient for a few hundred such warheads – and no more than several hundred at most [...]

This is broadly consistent with...estimates that China's stockpile of fissile material was sufficient for planned modernisation.¹⁶

In its most recent assessment, the [International Panel on Fissile Materials](#) broadly concurred with this view. It estimates that China currently has 14 metric tons of HEU and 2.9 tons of plutonium, for weapons purposes.¹⁷

4.3 Land-based capabilities

The primary nuclear mission is the responsibility of the People's Liberation Army Rocket Force.¹⁸ Ground-launched capabilities comprise approximately 280 land-based missiles, including:

- Intercontinental ballistic missiles (ICBM), specifically the DF-31, DF-31A, DF-5A and DF-5B.
- DF-26 dual-capable, intermediate range ballistic missiles (IRBM), which began deployment in 2018. With an estimated range in excess of 4,000km it is capable of striking targets in the western Pacific Ocean, including US military facilities in Guam. However, it is unclear how many of these dual-role missiles are assigned a nuclear role.
- DF-21 medium-range ballistic missiles. A third variant of the DF-21 (Mod 6), with improved range, mobility and accuracy was deployed in 2017.
- The DF-4 ICBM is thought to have been retired, or is in the process of being retired, from service.

¹⁶ Jeffrey Lewis, Paper tigers: China's nuclear posture, International Institute for Strategic Studies, 2014

¹⁷ The amount of HEU needed to make a nuclear weapon varies with the degree of enrichment and the sophistication of the weapon design. In general, the higher the enrichment level and greater sophistication, the less HEU is needed to make a bomb. Plutonium-based nuclear weapons only work as implosion weapons, with more sophisticated weapons using less plutonium. The International Panel on Fissile materials estimates a second generation boosted warhead would require 12kg of HEU or 4-5kg of plutonium. A first generation warhead would require 15-18kg of HEU or 5-6kg of plutonium.

¹⁸ A reorganisation of nuclear structures was completed in December 2015. The PLA Rocket Force replaced the Second Artillery Force in a move which has elevated the nuclear forces to a full service, equivalent to that of the army, navy and air force.

The solid-fuelled, road-mobile, DF-31 and DF-31A were considered major technological advancements on previous generations of liquid-fuelled, silo-based ICBM, as they provided the PLA with a credible, survivable nuclear strike capability. In particular, the DF-31A ICBM, which deployed in 2018, has provided China with the ability to deploy multiple warheads aboard its ICBM,¹⁹ and ensures coverage of most of the continental US. They have replaced the DF-4, while the process of replacing its older DF-5A ICBM with the new DF-31A is ongoing.

China is also reported to be bringing the new DF-41 road-mobile ICBM into service, with two mobile brigades fielded to date. Believed to be capable of carrying up to 10 warheads, it will have a range in excess of 12,000km. In their most recent assessment of Chinese nuclear capability, however, Hans Kristensen and Matt Korda suggest that three warheads are more likely to be assigned per missile in order to maximise range.²⁰ The remaining missile payload, they argue, is intended for decoys and penetration aids:

This is because we believe that the purpose of the MIRV program is to ensure penetration of US missile defences, rather than to maximize the warhead loading of the Chinese missile force.²¹

4.4 Naval capabilities

China established a submarine-launched nuclear capability in the mid-1980s with the development of a single Xia class SSBN equipped with 12 JL-1 submarine-launched ballistic missile (SLBM).

However, its operational status was questioned, thereby raising doubts over the credibility of China's first generation submarine-based deterrent. The Federation of American Scientists asserted that the Xia class SSBN had never conducted a deterrent patrol outside of Chinese territorial waters; while others argued that no nuclear-armed JL-1 ballistic missiles were ever deployed aboard the Xia class. A 2014 assessment published by the International Institute of Strategic Studies suggested that:

It is possible that the best description of the submarine is a prolonged form of 'trial operational deployment' similar to the early deployments of the DF-4 and DF-5. The Xia class submarine may not be operational, but it is presumably available in extremis for limited missions.²²

It is only since 2016, with the development of four Jin class SSBN, each equipped with 12 JL-2 SLBM, that China is considered to have established a credible sea-based element of its nuclear triad. In April 2020, a further two

¹⁹ Multiple independently targetable re-entry vehicle (MIRV) capability.

²⁰ Hans Kristensen and Matt Korda, [Chinese nuclear forces 2021](#), Bulletin of the Atomic Scientists

²¹ Hans Kristensen and Matt Korda, [Chinese nuclear forces 2021](#), Bulletin of the Atomic Scientists

²² Jeffrey Lewis, *Paper tigers: China's nuclear posture*, IISS, 2014

Jin class boats were delivered to the PLA Navy and entered service in 2021, to give a current SSBN force of six.

The Jin class constitutes major technological advancement over the Xia class submarine, particularly in relation to stealth, sonar, propulsion, command and control systems and overall survivability of the sea-based deterrent. The JL-2 SLBM, is a sea-based variant of the DF-31 and was successfully flight tested in 2013 and 2014. It provides greater range²³ and accuracy than its predecessor. Importantly the Jin class, provides China with a potential second-strike capability if it is operationally deployed. However, while the JL-2 would be capable of targeting Alaska, Guam, Hawaii, Russia and India from waters near China, it could not target the continental US unless it sailed deep into the Pacific Ocean.

There has also been considerable speculation as to when the Jin class could begin deterrent patrols. Many observers consider there has been little evidence, to date, to suggest that they have begun. Nevertheless, it is widely acknowledged that the fleet is active.²⁴ As SIPRI also observe:

The routine deployment by China of nuclear weapons on its SSBN's would constitute a significant change to the country's long-held practice of keeping nuclear warheads in central storage in peacetime and would pose operational challenges for its nuclear command and control arrangements.²⁵

As such, it remains unclear whether China will adopt a posture of continuous at-sea deterrence, akin to that operated by the US, UK and France, or whether it will patrol on a periodic basis like Russia.

4.5

Air-launched capabilities

In 2018 the Chinese Air Force (PLAAF) was reassigned a primary nuclear role, after decades of only providing a secondary nuclear capability.

In October 2019, China confirmed the PLAAF's nuclear status by publicly revealing the H-6N as its first long-range strategic bomber. A modified H-6 bomber, the H-6N has air to air refuelling capability and is capable of deploying with a nuclear-armed, air-launched ballistic missile (ALBM).²⁶ Two such missiles are thought to be under development. Such capability would represent a major advancement of China's aerial strategic nuclear deterrent. Indeed, the Pentagon's 2020 report on Chinese military power considers this new capability to provide China "for the first time with a viable nuclear triad of delivery systems dispersed across land, sea and air forces".

²³ The previous JL-1 has a range of approximately 1,700km; while the JL-2 has a range in excess of 7,000km

²⁴ See Kristensen and Korda, Nuclear Notebook: [Chinese nuclear forces 2020](#)

²⁵ SIPRI Yearbook 2022, [World Nuclear Forces](#), p.390

²⁶ The H-6 was only capable of deploying 1-3 free-fall nuclear bombs.

However, as Roderick Lee of the China Aerospace Studies Institute points out:

The implication for the US government is that China now possesses a full nuclear triad, albeit somewhat lopsided. In addition to the air-launched component of the PLA's nuclear triad being relatively small as of 2020, its potential range is also limited [...] H-6s equipped with even long-range stand-off munitions face a challenging geography should they wish to target CONUS [continental United States].

In order to range CONUS targets, an H-6... would have to either fly over Russian airspace or take a vulnerable 8,000km across the Pacific. Neither of these options seems optimal. This begs the question of why the PLA is pursuing an air-launched nuclear capability in the first place.²⁷

He goes on to suggest that China's nuclear armed strategic bombers may instead be intended to deter against one of the country's four regional nuclear neighbours, one of which (India) has an active border dispute with China.²⁸

²⁷ Roderick Lee, "China's Air Force might be back in the nuclear business", *The Diplomat*, 9 September 2020

²⁸ Roderick Lee, "China's Air Force might be back in the nuclear business", *The Diplomat*, 9 September 2020

5

Expansion of China's nuclear capabilities

“The modernization of nuclear weapons undertaken by China is aimed solely at ensuring the safety and security, reliability and effectiveness of those weapons”.

[People's Republic of China National Report to the 2022 NPT Review Conference](#)

China has been diversifying and expanding its nuclear force over the last few years with the specific intent of developing a more robust and survivable capability. Efforts to deploy a credible sea-based deterrent have also been viewed as a serious attempt to provide a credible second-strike capability.

However, Chinese efforts to actively expand both its stockpile and its capabilities has raised questions over compatibility with its posture of self-defence. In its 2020 assessment of Chinese military power, the Pentagon asserts:

We do believe that over the next decade, that China is likely to at least double the size of its nuclear stockpile in the course of implementing the most rapid expansion and diversification of its nuclear arsenal in its history, China's history.

An ability to double the stockpile not only demonstrates a move away from their historical minimum deterrence posture but places them in a position where they can readily grow their force beyond this number, which is part of the point.²⁹

In its 2021 report, the Pentagon went on to revise its estimate of potential warhead numbers, suggesting that China may have up to 700 deliverable nuclear warheads by 2027 and that it “likely intends to have at least 1,000 warheads by 2030, exceeding the pace and size the DoD projected in 2020”.³⁰ Such projections are thought to be based on China's construction of three new missile fields, capable of housing up to 300 missile silos (see below) and current stocks of fissile material which are considered more than adequate for doubling China's current nuclear inventory.³¹

China has justified its modernisation plans on the following grounds:

China deters other countries from using or threatening to use nuclear weapons against it by building its strategic nuclear force in accordance with the principle of competence and effectiveness; adapting to developing trends in military science and technology; and ensuring its protection, rapid-reaction, penetration, destruction and precise-strike capabilities, the safety, reliability and effectiveness of its nuclear weapons, and its strategic-deterrence and nuclear-counter-attack capabilities. Its nuclear weapons modernization is

²⁹ US Department of Defense, [Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2020](#), September 2020

³⁰ US Department of Defense, [Military and Security Developments Involving the People's Republic of China 2021](#)

³¹ Hans Kristensen and Matt Korda, [Chinese nuclear forces 2021](#), Bulletin of the Atomic Scientists

entirely aimed at ensuring the safety, security, reliability and effectiveness of its nuclear weapons.³²

5.1 Ground-launched capabilities

The incremental replacement of the DF-5A with the DF-31A continues which will make a greater proportion of China's future land-based force more manoeuvrable, flexible and with greater range. The DF-41 is currently being fielded, while rail-mobile and silo-based versions of the DF-41 ICBM are also believed to be under development. In its 2021 report to Congress on China's military power, the Pentagon also suggested that a new "long-range" missile, the DF-27, was also under development,³³ although SIPRI and other analysts have suggested that the information on this potential new missile is "rife with unsubstantiated rumours".³⁴

Nevertheless, in support of China's rapid expansion of its ICBM capabilities, in 2021 commercial satellite imagery revealed that three new ICBM missile silo fields were being constructed in the north of the country, capable of housing 300 individual missile silos. Located beyond the reach of conventional US long-range cruise missiles, analysts have suggested that the motivation behind the new missile fields could be to reduce the vulnerability of China's nuclear arsenal from long-range conventional first strikes. As SIPRI notes in its latest Yearbook for 2022, however:

As of January 2022, it was unclear how China plans to operate the new silos, whether they will all be filled, how many warheads each missile would carry, and whether a portion of them could potentially have conventional strike roles.³⁵

These new missile fields, along with the introduction of more MIRV-capable missiles is the basis for many of the estimates on future warhead numbers, including those of the US Department of Defense. As Kristensen and Korda note:

It should be emphasized, however, that it is currently unknown how China will operate the new silos, whether they will all be filled, and how many warheads each missile will carry. Either way, the sheer number of silos will likely have a significant effect on US strike planning against China.³⁶

³² Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation of the Treaty in the People's Republic of China, NPT/CONF.2020/PC.III/8, April 2019

³³ US Department of Defense, [Military and Security Developments Involving the People's Republic of China 2021](#)

³⁴ SIPRI Yearbook 2022, [World Nuclear Forces](#), p.387

³⁵ SIPRI Yearbook 2022, [World Nuclear Forces](#), p.386

³⁶ Hans Kristensen and Matt Korda, [Chinese nuclear forces 2021](#), Bulletin of the Atomic Scientists

5.2 Further SSBN

A next-generation SSBN, the Type 096, is expected within the next decade. It will reportedly carry the next generation JL-3 SLBM, which is thought to have a longer range (10,000km) than the JL-2 and might be MIRV capable. The most recent successful test of the JL-3 was in December 2019.

Construction of the Type 096 reportedly began in 2021. The PLA Navy is expected to operate the Jin class and the Type 096 SSBNs concurrently and could have eight-12 SSBNs in service by 2030.

5.3 A new stealth bomber

China is currently developing its first long-range stealth bomber known as the H-20. It is expected to be dual-role and fielded sometime in the late 2020s. There is speculation that the H-20 could be equipped with a nuclear cruise missile, although those reports have not been confirmed.

5.4 Hypersonic glide vehicles

In October 2019 China unveiled its DF-17 hypersonic boost glide vehicle (HGV).³⁷ While the HGV was presented at the time as having a conventional role, it has been suggested that it will be dual-capable. In February 2020 the Head of US Strategic Command, Admiral Charles Richard, referred to the DF-17 as a “strategic nuclear system”.³⁸ Reports suggest that China has begun to operationally deploy the DF-17.³⁹

China has continued to test hypersonic technologies which has led many to believe that the PLA Rocket Force “may be developing innovative new weapons-delivery systems”.⁴⁰ Of note were two tests, conducted in mid-2021, of what is thought to be an orbital hypersonic weapon system, what has been referred to as a [fractional orbit bombardment system](#). The Chinese

³⁷ Hypersonic missiles can travel five times faster than the speed of sound. There are generally two categories: cruise missiles powered by engines and glide vehicles which are launched nearly into space before diving back down to a target. Hypersonic cruise missiles are manoeuvrable and fly at lower altitudes making them more difficult to detect than a ballistic missile which flies on a more predictable trajectory. Such characteristics arguably make hypersonic missiles more destabilising as they reduce response time and make it difficult to distinguish between a nuclear and conventionally armed weapon

³⁸ [Statement before the Senate Armed Services Committee](#), 13 February 2020

³⁹ CSIS, Missile Defense Project, [DF-17](#) (accessed 26 July 2022)

⁴⁰ IISS Strategic Comments, [“China’s 2021 orbital weapon tests”](#), February 2022

government have denied such claims, however, stating that the tests were related to its civilian space programme.⁴¹

While such technology could significantly increase China's nuclear second-strike capabilities, there is uncertainty over the role that it could play in China's overall nuclear posture. As the International Institute for Strategic Studies noted in February 2022:

It is not clear whether the payloads of the weapons under development are intended to be conventional or nuclear, which could cause confusion in a crisis. This is true of many hypersonic gliders, however. There is also no clear evidence that these weapons, if adopted, would have a significant effect on strategic stability, given that China is already capable of penetrating US missile defences using currently deployed missile technology.⁴²

Box 1: Suggested reading

- SIPRI Yearbook 2022, [World Nuclear Forces](#)
- US Department of Defense, [Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021](#) (PDF)
- Hans Kristensen and Matt Korda, [Chinese nuclear forces 2021](#)
- Bleddyn Bowen and Cameron Hunter, [Chinese fractional orbital bombardment](#), Asia-Pacific Leadership Network, November 2021
- Arms Control Association, [China's nuclear expansion: The challenges, implications and risk reduction options](#), 17 November 2021
- Atlantic Council, [Deterring Chinese strategic attack: Grappling with the implications of China's strategic forces buildup](#), 2 November 2021
- Tong Zhao, ["China's silence on nuclear arms buildup fuels speculation on motives"](#), Bulletin of the Atomic Scientists, 12 November 2021
- RUSI Commentary, [China's new hypersonic capability](#), 26 October 2021

⁴¹ IISS Strategic Comments. ["China's 2021 orbital-weapon tests"](#), February 2022

⁴² IISS Strategic Comments. ["China's 2021 orbital-weapon tests"](#), February 2022

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