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Before
The U.S.-China Economic and Security Review Commission
Hearing On
China's Nuclear Forces

Let me begin by expressing my appreciation to the Commission for the opportunity to testify here today on China's nuclear force developments. It is an issue that gained increased momentum in recent years in discussions about China's objectives and U.S. defense requirements.

In this testimony I will first describe the status of China's nuclear forces, briefly outline the major phases of the history, and address the modernization currently underway. Next, I will discuss various estimates for the size of the Chinese nuclear warhead stockpile and projections for its potential future development. I will then discuss China's possible intent with its modernization, before ending my testimony with some conclusions and recommendations.

Let me issue a caveat at the outset: I do not have access to classified information and never had. As such I'm not privy to the U.S. Intelligence Community's data other than what is occasionally declassified and published in reports and testimonies. As Director of the Nuclear Information Project at the Federation of American Scientists my job is to analyze that and other information and makes sense of it. We do that in the form of the Nuclear Notebook column published in the Bulletin of the Atomic Scientists since 1987, and the World Nuclear Forces Chapter in the SIPRI Yearbook. As I describe below, that can sometimes be a challenge.

The Status of Chinese Nuclear Forces

China is well underway with its most substantial nuclear weapons modernization effort since it first acquired nuclear weapons in the 1960s. The force is modest compared with U.S. and Russian nuclear forces but significant compared with China's nuclear history and other smaller nuclear-armed states.¹ This is China's fourth modernization phase.

The first phase, in the 1960s and 1970s, introduced bombers and liquid-fuel moveable medium-range ballistic missiles (MRBMs) such as the DF-1, DF-2, and the first version of the DF-3. The second phase, in the 1980s and 1990s, introduced longer-range liquid-fuel moveable and silo-based intercontinental ballistic missiles (ICBMs) that put all of Russia and India and

¹ For a 2020 overview of Chinese nuclear forces, see: Hans M. Kristensen and Matt Korda, "Chinese nuclear force, 2020," FAS Nuclear Notebook, *Bulletin of the Atomic Scientists*, December 2020, <https://www.tandfonline.com/doi/pdf/10.1080/00963402.2020.1846432?needAccess=true&>

nearly all of the United States within reach. This phase also introduced the first solid-fuel road-mobile MRBM (the DF-21), and an experimental nuclear-powered ballistic missile submarine (SSBN) (Type 092). The third phase, in the first decade-and-a-half of the 2000s, introduced solid-fuel road-mobile ICBMs (the DF-31/A), an upgrade to the liquid-fuel ICBM (the DF-5B) with multiple independently targetable warheads (MIRVs), and a small fleet of SSBNs (Type 094). This phase also fielded significant conventional medium-range missiles (the DF-21C/D) to complement Chinese nuclear forces and provide the country's leadership with regional strike options below the nuclear threshold.

The fourth modernization phase currently underway is fielding a broad set of nuclear weapons systems that appear intended to upgrade older systems, add new types, and eventually develop a triad of long-range strategic forces complemented by medium- and intermediate-range ballistic missiles. The PLARF force structure currently includes at least 40 missile brigade bases of which up to half might have nuclear capability.² Let me briefly outline the major programs:

The ICBM force is transitioning from liquid-fuel silo-based and roll-out-to-launch missiles to solid-fuel silo-based and road-mobile launchers. Apart from enhancing military capabilities, which is always a product of modernization, that transition appears to be motivated by an effort to reduce the vulnerability of the ICBM to a surprise attack and safeguard China's retaliatory capability. That mean phasing out the liquid-fuel DF-4 and in the future probably also the silo-based liquid-fuel DF-5 (for now, the DF-5 is still being upgraded; the DF-5B can carry up to 5 MIRV). New or upgraded ICBMs being fielded in this phase include the DF-31AG, which is replacing the DF-31A and DF-31, as well as the DF-41, which became operational in 2020 and is China's first MIRV-capable mobile ICBM (rumors about DF-41 capability range from 3 to 10 warheads; more will reduce range). Rail and silo-based options apparently are also under consideration. In 2019, I reported DF-41 launcher training at PLARF's training area near Jilantai in north-central China, shortly before the launcher was first displayed at a military parade in Beijing.³

Coinciding with the introduction of enhanced and new road-mobile ICBMs, the PLARF has also increased the number of launchers assigned to many of its ICBM brigades.⁴ As a result, the number of ICBMs has increased from about 35 in 2000 (of which 20 with as many warheads could reach almost all of the continental United States), to just over 100 missiles today (of which nearly all can reach some or nearly all of the continental United States with more than 125 nuclear warheads). The Pentagon stated last year that "the number of warheads on Chinese ICBMs capable of reaching the USA is expected to grow to 200 by 2025. (Note: "USA" does not

² For overviews of PLARF bases, see: Hans M. Kristensen, "China's Strategic Systems and Programs," and Bates Gill, "Organization of China's Strategic Forces," both in James M. Smith and Paul J. Bolt (ed.), *China's Strategic Arsenal: Worldview, Doctrine, and Systems* (Georgetown University Press: Washington, D.C.: 2021), pp. 98-101 and 170; Peter W. Singer and Ma Xiu, "China's missile force is growing at an unprecedented rate," *Popular Science*, February 25, 2020; Decker Eveleth, "Mapping the People's Liberation Army Rocket Force," *aboyandhis.blog*, April 9, 2020; Mark Stokes, *PLA Rocket Force Leadership and Unit Reference*, Project 2049 Institute, April 9, 2018.

³ Hans M. Kristensen, "New Missile Silo and Df-41 Launchers Seen in Chinese Nuclear Missile Training Area," *FAS Strategic Security Blog*, September 3, 2019, <https://fas.org/blogs/security/2019/09/china-silo-df41/>

⁴ Decker Eveleth, "China's Mobile ICBM Brigades: DF-31 and DF-41," *aboyandhisblog.com*, July 2, 2020, <https://www.aboyandhis.blog/post/china-s-mobile-icbm-brigades-the-df-31-and-df-41>

necessarily refer to the continental USA but might also include Alaska, Hawaii, and Guam). Not all of China's ICBMs are necessarily targeted against the United States; some cover Russia and India.

The PLARF also operates a force of shorter-range nuclear-capable ballistic missiles apparently intended to cover regional scenarios against targets in Guam, India, Japan, Russia, and South Korea. The Pentagon refers to missiles in this category as “non-strategic nuclear weapons,”⁵ even though China considers all of its nuclear weapons to be strategic. This category includes the solid-fuel DF-21 medium-range missile of which the existing DF-21A (CSS-5 Mod 2) is being upgraded with the DF-21E (CSS-5 Mod 6). The DF-21, which was China's first solid-fuel road-mobile ballistic missile, has now completely replaced the older liquid-fueled DF-3A. The new DF-21E has not been displayed; it could potentially be an upgraded missile or the existing DF-21 on a better launcher or a combination. It is important to remind that most DF-21 versions (DF-21C and DF-21D) are not nuclear.

China's regional deterrent force now also includes the DF-26, a dual-capable intermediate-range ballistic missile (IRBM) with improved accuracy that began fielding in 2016. The missile is being fielded in significant numbers, although there appears to be some disagreement about how many: OSD says 200, INDOPACOM says 100. Although the DF-26 is dual-capable, most units are probably assigned conventional missions. In early-2019, I geo-located a DF-26 exercise announced by Chinese media to the new PLARF training area near Jilantai in the Inner Mongolia province.⁶ And in early 2020, the DF-26 was first reported at the PLARF training site near Qingzhou in eastern China, as well as in Korla in western China, as well as significant numbers of launchers at production facilities.⁷ It is possible that the DF-26 will replace some of the DF-21 units.

The naval portion of the current modernization phase involves expanding the small fleet of Type 094 class ballistic missile submarines, as well as developing a replacement known as the Type 096. The current fleet builds on the single Xia-class (Type 092), which was not successful, never sailed on a deterrent patrol, but was used to develop technology for subsequent nuclear-powered submarines. Whereas the current subs are equipped with the single-warhead JL-2 missile, the new sub will carry the JL-3 missile, which might be capable of delivering multiple warheads.

The current SSBN force is, in my view, somewhat of an oddball in China's nuclear posture. With a range of some 7,400 km (4,600 miles), the JL-2 missile cannot reach the continental United States or Hawaii from waters near China. Nor can it reach western Europe. To provide a hypothetical retaliatory capability against the United States, a Type 094 would need to sail deep into the Pacific Ocean and potentially expose itself to US and allied anti-submarine

⁵ US Department of Defense, “Global Nuclear Capability Modernization: Global Nuclear-Capable Delivery Vehicles,” Fact Sheet, February 2, 2018, <https://media.defense.gov/2018/Feb/02/2001872878/-1/-1/1/GLOBAL-NUCLEAR-MODERNIZATION.PDF>

⁶ Hans M. Kristensen, “Chinese DF-26 Missile Launchers Deploy to New Missile Training Area,” *FAS Strategic Security Blog*, January 21, 2019, <https://fas.org/blogs/security/2019/01/df-26/>

⁷ Hans M. Kristensen, “China's New DF-26 Missile Shows Up At Base In Eastern China,” *FAS Strategic Security Blog*, January 21, 2020, <https://fas.org/blogs/security/2020/01/df-26deployment/>

forces (the Type 094 is relatively noisy: similar to 1970s-era Soviet SSBNs). Long-range patrols are rare, so the Chinese SSBN force may instead be intended to operate from a protected bastion in the South China Sea (all six are homeported on Hainan Island). Instead of a viable secure retaliatory capability, the current SSBN fleet for now seems more like a work in progress and more useful for regional targeting against U.S. bases in the region as well as India and Russia.

The new Type 096 SSBN will, once it begins to enter the fleet in the mid-2020s, also have shortcomings. Even with the 10,000+ km (6,300+ miles) JL-3 SLBM, a submarine would not be able to strike the continental United States from the South China Sea (it could reach most of western Europe, though). To target the continental United States, the submarine would have to launch its missile from northern Chinese waters. A launch from the Bohai Sea, for example, would potentially be capable of reaching the entire U.S. west coast and almost all the north-western parts of the country including all three ICBM bases. Striking Washington D.C. would require sailing into waters between Japan and Russia or deep into the Pacific Ocean. Again, it is worth reminding that China can already target all of those areas with its land-based missiles.

The final nuclear effort of the current modernization phase involves the development of an active nuclear role for China's bombers. This includes, in the near term, development of an air-launched ballistic missile for a modified H-6 bomber (H-6N), and development of a long-range bomber (H-20) with nuclear capability for deployment in the mid- to late-2020s.

The Nuclear Stockpile: Status and Projections

To arm all of these modified and new delivery systems, China needs more nuclear warheads. U.S. officials have recently made public projections that they expect China to significantly increase its nuclear warhead stockpile over the next decade. But an increase from what to what?

The size of the Chinese nuclear stockpile has been the subject of much uncertainty and speculation over the years. The Chinese government has, as far as I know, never disclosed the exact size of its nuclear warhead stockpile. In 2004, however, a Chinese Foreign Ministry fact sheet stated: "Among the nuclear-weapon states [the P5], China...possesses the smallest nuclear arsenal."⁸ That was a true statement at the time when the British stockpile was around 280 warheads.

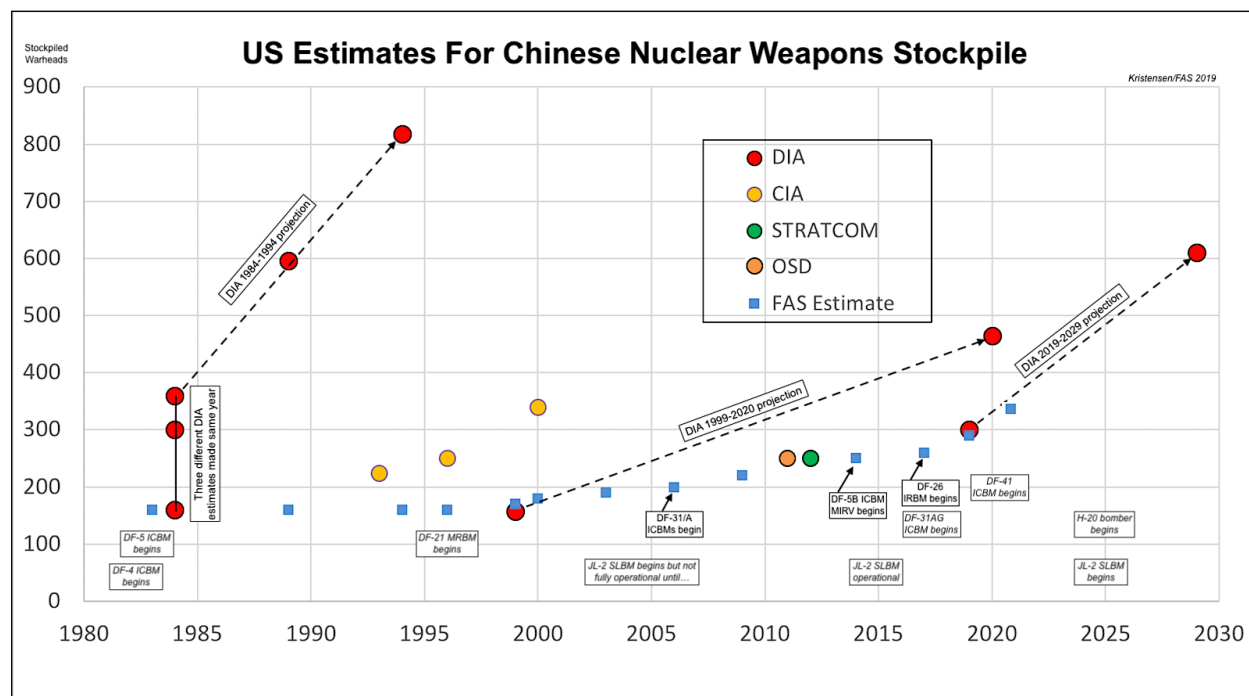
In 2012, when rumors suggested China might have many more warheads (hundreds, even thousands), STATCOM commander Robert Kehler rejected it: "I do not believe that China has hundreds or thousands more nuclear weapons than what the intelligence community has been saying, [...] that the Chinese arsenal is in the range of several hundred" warheads.⁹

Seven years later, in 2019, Defense Intelligence Agency director Lt. Gen. Robert Ashley gave a similar number: "We estimate...the number of warheads the Chinese have is in the low

⁸ Ministry of Foreign Affairs of the People's Republic of China, "China: Disarmament and Reduction of [sic]," Fact Sheet, April 27, 2004, p. 2, document available at <https://fas.org/nuke/guide/china/doctrine/fs042704.pdf>

⁹ Hans M. Kristensen, "STRATCOM Commander Rejects High Estimate for Chinese Nuclear Arsenal," *FAS Strategic Security Blog*, August 22, 2012, <https://fas.org/blogs/security/2012/08/china-nukes/>

couple of hundreds.”¹⁰ DIA has made several projections about China’s nuclear stockpile in the past that proved to be wrong (see image below). But the latest DIA number was repeated in the 2020 DOD report on China’s military developments: “China’s nuclear warhead stockpile - currently estimated to be in the low-200s...”¹¹ In the back of the report, however, a fuller statement appeared to include a caveat: “Currently, China probably maintains an *operational* nuclear warhead stockpile in the low-200s.”¹² (Emphasis added.)



At FAS, we interpreted “operational” to imply that the “low-200s” number only included warheads assigned to operational launchers with an active nuclear mission. This interpretation was confirmed by a tweet by arms control ambassador Marshall Billingslea: “Caveats are important. Report assigns rough number for “operational” warheads.”¹³ If so, warheads produced for new launchers that had not become operational - such as the DF-41 and the two additional Type 094 submarines, or a small number of bombs potentially held in deep storage for a secondary contingency mission for a small number of H-6 bombers - might not be included in

¹⁰ “The Arms Control Landscape: Featuring DIA Lt. Gen. Robert P. Ashley, Jr. on Russian and Chinese nuclear weapons,” *The Hudson Institute*, May 29, 2019, <https://www.hudson.org/events/1694-the-arms-control-landscape52019>

¹¹ US Department of Defense, Office of the Secretary of Defense, *Military and Security Developments Involving the People’s Republic of China 2020*, September 2020, p. 85, <https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF>

¹² Ibid, p. 87.

¹³ Marshall Billingslea, Special Presidential Envoy for Arms Control, tweet, September 4, 2020, <https://twitter.com/USArmsControl/status/1301988946449227777>

the count. Consequently, at the time of the 2020 DOD report, we put our Chinese stockpile estimate at around 320 warheads.¹⁴

Whatever the exact warhead number, U.S. officials have been clear that they expect the number to increase significantly over the next decade. China “is likely to at least double the size of its nuclear stockpile” over the next decade, DIA stated in 2019.¹⁵ Just a few months ago, STRATCOM commander Charles Richard said China is “well ahead of the pace necessary to double their nuclear stockpile by the end of the decade,”¹⁶ and projected the stockpile might increase even more: “double (if not triple or quadruple) over the next decade.”¹⁷

Whether such an increase will happen - or can happen - depends on a number of factors and assumptions. Most importantly, what is the Chinese government’s own plans? How would the structure of the Chinese nuclear arsenal have to change to accommodate such warhead increases? What is the Chinese capacity for production and integration of significant numbers of additional nuclear weapons? How many facilities can China build to accommodate these additional forces?

Answering these questions in detail goes beyond the scope of this testimony. But to illustrate the potential force structure implications of the various stockpile increases suggested by U.S. defense officials above, the table below shows hypothetical nuclear forces structures for a doubling, tripling, and quadrupling of the Chinese nuclear warhead stockpile.

A doubling of the stockpile seems plausible given the recent and ongoing modernization of the arsenal. But it would be a major undertaking potentially requiring increasing the number of DF-31AG brigades, doubling the current number of road-mobile DF-41s with MIRV, deploying a new brigade of silo-based DF-41s with MIRV, fielding at least one Type 096 SSBN with MIRVed JL-3 missiles in addition to the six Type 094 SSBNs already in service, and fielding more than a dozen nuclear bombers. Fewer launchers would require greater MIRV loading.

A tripling of the stockpile would require even greater force structure changes. To accommodate the additional warheads, I had to increase the number of DF-31AG and DF-41 brigades even further, add a number of rail-based DF-41s, add yet another SSBN for a total of eight, double the number of bombers as well as their weapons capacity.

To create the hypothetical force structure necessary for a quadrupling of the stockpile, even more road-mobile and rail-based missiles were needed, more DF-26 units were assigned nuclear warheads, and more bombers were added with greater weapons capacity. Moreover, a

¹⁴ Shannon N. Kyle and Hans M. Kristensen, “Chinese nuclear forces,” in *SIPRI Yearbook 2020: Armament, Disarmament and International Security* (Oxford University Press: 2020), p. 356, https://www.sipri.org/sites/default/files/2020-06/yb20_10_wnf.pdf

¹⁵ Robert P. Ashley, Lt. Gen., Director, Defense Intelligence Agency, “Russian and Chinese Nuclear Modernization Trends,” Remarks at the Hudson Institute, May 29, 2019, <https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/>

¹⁶ Charles A. Richard, Commander, US Strategic Command, prepared statement before the Senate Armed Services Committee, April 20, 2021, p. 6, <https://www.armed-services.senate.gov/imo/media/doc/Richard04.20.2021.pdf>

¹⁷ Charles A. Richard, Commander, US Strategic Command, “Forging 21st-Century Strategic Deterrence,” *US Naval Institute Proceedings*, February 2021, <https://www.usni.org/magazines/proceedings/2021/february/forging-21st-century-strategic-deterrence>

quadrupling of the stockpile also required increasing the MIRV loading on some of the DF-41 ICBMs.

Hypothetical Chinese Nuclear Force Structures With Different Stockpile Increases									
		2020				2030			
		If "low-2000s" stockpile		If "double" stockpile		If "triple" stockpile		If "quadruple" stockpile	
Type	NATO/US Name	Launcher	Warheads	Launcher	Warheads	Launcher	Warheads	Launcher	Warheads
Land-based ballistic missiles									
DF-4	CSS-4	6	6	0	0	0	0	0	0
DF-5A	CSS-5 Mod 2	10	10	0	0	0	0	0	0
DF-5B	CSS-5 Mod 3	10	50	10	50	10	50	10	50
DF-5C	CSS-5 Mod 4			10	10	10	50	10	50
DF-21A/E	CSS-5 Mod 2/6	40	40						
DF-21E	CSS-5 Mod 6			40	40	40	40	40	40
DF-26	CSS-18	80	20	200	20	200	20	200	100
DF-31	CSS-10 Mod 1	6	6	0	0	0	0	0	0
DF-31A	CSS-10 Mod 2	24	24	0	0	0	0	0	0
DF-31AG	(CSS-10 Mod 3)?	24	24	84	84	96	96	108	108
DF-41	CSS-20	0	0	32	96	48	144	48	144
DF-41A (silo)	(CSS-20 Mod 1)?	0	0	10	30	20	60	20	100
DF-41B (rail)	(CSS-20 Mod 2)?					10	30	20	100
Subtotal		200	180	386	330	434	490	456	692
Sea-based ballistic missiles									
JL-2	CSS-N-14	48	48	72	72	72	72	72	72
JL-3	(CSS-N-15)?			12	36	24	72	24	72
Subtotal		48	48	84	108	96	144	96	144
Subtotal Ballistic Missiles:		248	228	470	438	530	634	552	836
Air-based weapons									
H-6K (bomb)		20	20						
H-6N (ALBM)				10	10	20	20	20	20
H-20 (ALBM/ALCM)?				10	20	20	40	30	60
Subtotal		20	20	20	30	40	60	50	80
Total		268	248	490	468	570	694	602	916
Stockpile increase (%):					105		204		302
* Based on projections made by US Strategic Command, US Defense Intelligence Agency, and the Office of the Secretary of Defense for the increase of China's nuclear warhead stockpile over the next decade.									
Hans M. Kristensen, FAS 2021									

Potential Intentions

The descriptions of China's nuclear modernization and the projections for the possible increase of the nuclear warhead stockpile are often accompanied by claims about intent. This includes whether China still has a minimum deterrent - or can have it with twice the number of warheads, whether one can trust China's No-First-Use policy and pledge not to attack with nuclear weapons any non-nuclear country, whether construction of new silos and development of ballistic missile warning capabilities signal China is moving to a "launch-on-warning" posture with nuclear warheads loaded on missiles on high alert.

Minimum deterrent is a vague and undefined term. All nuclear-armed states claim they only have the minimum number of nuclear weapons needed for their defense. But as a country that has said for many years that its small arsenal constituted a minimum deterrent, China obviously should explain how a larger arsenal can also be a minimum deterrent. Compared with the arsenals of Russia and the United States, China will of course continue to have a minimum deterrent even when its ongoing modernization is completed.

In addition to stockpile size, however, new and improved military capabilities also raise questions about China's intent. This is specifically the case with the new ICBM silos under construction as well as the dual-capable DF-26 and the decision to reactivate the nuclear bomber mission.

The construction of more than a dozen silos in the PLARF training area near Jilantai, combined with China's efforts to develop some kind of early-warning capability against ballistic missile attacks, caused the Pentagon to publicly declare in 2020 that "China intends to increase the peacetime readiness of its nuclear forces by moving to a launch-on-warning (LOW) posture with an expanded silo-based force."¹⁸ The public statement appeared to be, at least in part, based on my report in September 2019 about construction of new missile silos at Jilantai.¹⁹ Since then, silo construction has increased significantly in the area, with more than a dozen silos detected so far.²⁰

Why China is building so many silos in a training area is unclear. It is possible that PLARF is experimenting with different designs and concepts before it begins to construction new silos in the operational missile brigade areas.²¹ The silos are too small for the current silo-based DF-5 (even though DF-5Bs have been seen operating in the area), and it is possible that the silos are intended for the DF-41 or a DF-31A ICBM. There are several potential explanations for this development. One is that China feels more vulnerable to surprise attack and has decided to increase the number of silos to safeguard some retaliatory capability. Another potential explanation is that the DF-5 is getting old and needs to be replaced by new solid-fuel missiles.

It is potentially also possible that China has decided to place ICBMs on high alert with warheads and is developing an early-warning capability to allow solid-fuel missiles to launch before their silos can be destroyed. This appears to be the interpretation that the Pentagon has made. There is still no public information that confirms China has decided to transition to an actual alert posture under normal circumstance, but it is possible that it is developing capabilities and procedures for being able to switch to such a posture in a crisis.

I frequently hear claims that one cannot trust China's no-first-use pledge. "I think I could drive a truck through the no first use policy," STRATCOM commander Richard Ridiculed last year in testimony before the Senate last year. China might have different definitions for what no-

¹⁸ US Department of Defense, Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2020*, September 2020, pp. 85, 88-90, <https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF>

¹⁹ Hans M. Kristensen, "New Missile Silo and Df-41 Launchers Seen in Chinese Nuclear Missile Training Area," *FAS Strategic Security Blog*, September 3, 2019, <https://fas.org/blogs/security/2019/09/china-silo-df41/>

²⁰ Hans M. Kristensen, "China's Expanding Missile Training Area: More Silos, Tunnels, and Support Facilities," *FAS Strategic Security Blog*, February 24, 2021, <https://fas.org/blogs/security/2021/02/plarf-jilantai-expansion/>

²¹ There are possible indications of construction of silos near Checunzhen (Sundian or Sun-tien) in the western part of the Henan province. See: Scott LaFoy and Decker Eveleth, "Possible ICBM Modernization Underway at Sundian," *Arms Control Wonk*, February 5, 2020, <https://www.armscontrolwonk.com/archive/1208828/possible-icbm-modernization-underway-at-sundian/>

first-use means than the United States or under what conditions the policy would apply.²² But the Pentagon concludes for years that there is “no indication that [Chinese] national leaders are willing to attach...nuances and caveats publicly to China’s existing NFU policy...”²³

I personally doubt any country would refrain from using nuclear weapons first if it concluded its survival depended on it, whether it has a no-first-use policy or not. More than a guarantee for anything during a war, the most beneficial and impactful effect of a no-first-use policy is probably its potential to limit the ambitions and readiness of the nuclear posture.

China’s fielding of the dual-capable DF-26 with its increased accuracy (although mainly for conventional missions) has raised speculations about its potential use as a nuclear precision strike tactical nuclear weapon. After referring to non-official discussions about a need for low-yield nuclear weapons to reduce collateral damage, the Pentagon in 2020 described the DF-26 as “China’s first nuclear-capable missile system that can conduct precision strikes, and therefore, is the most likely weapon system to field a lower-yield warhead in the near-term.”²⁴ As mentioned above, a Pentagon fact sheet in 2018 described the DF-26 as a “tactical nuclear weapon.”²⁵

Although modern Chinese warheads have lower yield than their first-generation Megaton-yield weapons, there is no public indication that it has decided to use the DF-26 or other nuclear weapons as tactical nuclear weapons. Nonetheless, the DF-26 and China’s decision to reactivate a nuclear mission for the bombers is raising questions about whether China is increasing the role of regional weapons in its nuclear strategy. At the same time, there is nothing new about regional-range nuclear weapons in Chinese nuclear planning per se; regional missiles were one of the very first categories of nuclear weapons China deployed, well before ICBMs.

Conclusions and Recommendations

In conclusion, China’s nuclear modernization is significant, important, and requires close monitoring, analysis, and debate. Despite the current modernization and the focus it receives in the public debate, however, the PLARF is - unlike its predecessor the Second Artillery Corps two decades ago - predominantly a *conventional* force, and increasingly so. That fact is often overlooked in the public debate. Statements made by U.S. military and intelligence officials, for example, assert that China has “the most active and diverse ballistic missile development

²² US Strategic Command, “U.S. Strategic Command and U.S. Northern Command SASC Testimony,” February 13, 2020, <https://www.stratcom.mil/Media/Speeches/Article/2086752/us-strategic-command-and-us-northern-command-sasc-testimony/>

²³ US Department of Defense, Office of the Secretary of Defense, *Military and Security Developments Involving the People’s Republic of China 2020*, September 2020, p. 86, <https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF>

²⁴ Ibid, p. 88.

²⁵ US Department of Defense, “Global Nuclear Capability Modernization: Global Nuclear-Capable Delivery Vehicles,” Fact Sheet, February 2, 2018, <https://media.defense.gov/2018/Feb/02/2001872878/-1/-1/1/GLOBAL-NUCLEAR-MODERNIZATION.PDF>

program in the world”²⁶ and “launched over 400 ballistic missiles (more than the rest of the world combined for non-wartime uses)” over the past two years.²⁷ Most of those missiles are *conventional*, however, and only a smaller portion of the missile tests involved *nuclear* missiles.

The DIA stated in 2019 that China’s growing nuclear arsenal “is consistent with Chinese President Xi’s vision for China’s military, which he laid out at the 19th Party Congress and stated that China’s military will be ‘fully transformed into a first tier force’ by 2050.”²⁸ Although it may be consistent with Xi’s vision, it is important to note that the origins of much of the current nuclear modernization dates back to well before he became the Chinese president. The DF-41 program, for example, dates back to the 1990s, and most of the current SSBN fleet was laid down before Xi took control. The DF-26 also dates back to before Xi, although he might have increased the numbers.

Nonetheless, China’s significant modernization and its growing warhead inventory raise valid questions about its plans and intent. How much does it plan to produce and deploy and when? The projections made by the U.S. military and Intelligence Community about China’s expected increase of its nuclear weapons stockpile over the next decade have created significant discussion. Many questions remain, however, both about the increase, how DIA and STRATCOM make the projections, and what an increase means for Chinese intentions.

There is no authoritative information that I’m aware of that suggests China is seeking nuclear parity with the United States. Even with STRATCOM’s most extreme projection of a quadrupling of the Chinese stockpile size described by DOD in 2020, China would only reach up to 1,000 warheads - less than one-third of the current U.S. nuclear weapons stockpile. Even in my exaggerated hypothetical force structure, that would only add up to about 200 ICBMs, half of the U.S. ICBM force, nearly 100 SLBMs compared with 240 for the United States, and 50 bombers compared with 60 U.S. nuclear bombers.

Chinese secrecy is of course an important reason for the uncertainty about the status and future of the Chinese nuclear arsenal. Secrecy has traditionally been a key component of China’s effort to protect its relatively small nuclear arsenal, and China still has far to go before it can claim any official degree of transparency about its nuclear arsenal. At the same time it is important to remember that it takes a long time for nuclear-armed states - certainly authoritarian regimes - to become comfortable with some degree of transparency. That was also the case for the United States - and it still has issues, including some that make it harder to monitor and understand Chinese nuclear developments.

²⁶ US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat*, July 2020, p. 2, https://media.defense.gov/2021/Jan/11/2002563190/-1/-1/1/2020%20BALLISTIC%20AND%20CRUISE%20MISSILE%20THREAT_FINAL_2OCT_REDUCEDFILE.PDF

²⁷ Charles A. Richard, Admiral, Commander, US Strategic Command, prepared statement before the Senate Armed Services Committee, April 20, 2021, p. 8, <https://www.armed-services.senate.gov/imo/media/doc/Richard04.20.2021.pdf>

²⁸ Robert P. Ashley, Lt. Gen., Director, Defense Intelligence Agency, “Russian and Chinese Nuclear Modernization Trends,” Remarks at the Hudson Institute, May 29, 2019, <https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/>

Until 2010, for example, the annual DOD report on Chinese military developments included a table with a detailed breakdown of the Chinese missile force. In the 2011 issue, however, the table was changed so it only showed overall missile categories. In 2013-2015, even the abbreviated table disappeared completely, until it returned in 2016. It would help the public debate considerably if future reports would include a breakdown of the Chinese missile force.

Likewise, until 2010, the Office of Naval Intelligence would declassify and release the annual number of Chinese general-purpose and ballistic missile submarine patrols. In 2010, however, the office suddenly began to classify the precise numbers and instead released a range. Initially the range was five (11-13, for example), but in 2013 all data was denied. It would help the public debate if ONI restored its previous long-held declassification policy and released the annual submarine patrol numbers again.

With this I end my prepared testimony. Thank you for the opportunity to testify. I look forward to your questions.