



Fact Sheet: Chinese Nuclear Modernization

ASP

American Security Project



Tomaz Strojnik

August 2016

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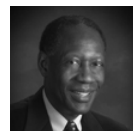
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Chuck Hagel served as the 24th U.S. Secretary of Defense and served two terms in the United States Senate (1997-2009). Hagel was a senior member of the Senate Foreign Relations; Banking, Housing and Urban Affairs; and Intelligence Committees.



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Introduction

This fact sheet compiles its information from a number of open-source and academic resources, and seeks to provide a resourceful document on the history, the development, and the future of China's nuclear strategy.

- Since the detonation of People's Republic of China's (PRC) first nuclear device on October 16, 1964, the country has adopted a policy of no-first-use (NFU).¹
- For the past twenty years, China has significantly transformed the types of ballistic missiles that it has employed in the Pacific theatre.
 - The PRC switched from an arsenal primarily consisting of intermediate/medium-range ballistic missiles to one consisting of intercontinental ballistic missiles.
- As the United States continues to expand its ability to strike targets around the world from a relatively safe distance, the PRC will modernize its military forces.
 - These modernization efforts focused on ensuring the survivability of the country's nuclear forces and possibly altering its policy of assured retaliation to one that is more aggressive.
- Though the PRC has not undergone an arms race with the United States, the country is taking small, precautionary steps to increase the number of deployed warheads and adopting postures that are perceived by the international community as offensive.

Delivery Systems

- The PRC's first delivery system was the strategic bomber.
 - The People's Liberation Army (PLA) have based their bombers off of Soviet models
 - The most current strategic bomber, Xian H-6K, is based off of the Tupulov Tu-16 twin engine bomber that was licensed to the PLA in the 1950s.²
 - Although based off of Soviet models, they have been continuously updated and modified to fit specific mission types.
 - The bomber force was quickly expanded to over 100 aircraft and "constituted almost 45 percent of China's nuclear weapon launchers as of 1985"³ but was given less emphasis following the development of the intermediate-range ballistic missile (IRBM) and strategic considerations.⁴
 - Due to the dual role that the PLA places on strategic bombers, the number of bombers that the PLA has specific to nuclear missions is unknown.⁵

- The development of ballistic missiles (Dong Feng) followed the same progression as other nuclear armed states.
 - Testing and production of ballistic missiles began prior to the June 17, 1967 hydrogen bomb test.
 - The Sino-Soviet Split prompted the PLA to develop only medium-range ballistic missiles (MRBM) and intermediated-rang intercontinental ballistic missiles (IRBM) in order to target Siberian cities following the deployment of Soviet troops along the Mongolian border in 1972.⁶
 - In 1980, the PRC deployed a full range intercontinental ballistic missile capable of hitting the United States and in 1981, it successfully launched a multiple independently targetable reentry vehicle (MIRV).
 - Procurement of this launch vehicle should be seen as part of the embryonic development of the technical aspects of nuclear weapons.
- China's sea-based missile program experienced the same type of rapid expansion as did the land and air legs of the triad.
 - The country became the fifth nuclear state to obtain a submarine-launched ballistic missile (SLBM) on October 16, 1982.
 - The evolution of the sea-based forces, starting from the development of a diesel-powered submarine armed with ballistic missiles (SSB) to a nuclear-powered ballistic missile submarine (SSBN), spanned only fourteen years.⁷
 - The PLA Navy currently has five Jin-class SSBNs.⁸



Jin class Type 094 SSBN. Image source: Wikimedia Commons/CRS/US Navy

Delivery System Estimates ⁹		
Type	Missiles	Estimated Range ¹⁰
Intercontinental Ballistic Missiles		
DF-31 (CSS-10)	8	8,000-11,700 km
DF-31A (CSS-10 Mod 2)	24	8,000-11,700 km
DF-4 (CSS-3)	10	4,750 km
DF-5A (CSS-4 Mod 2)	10	12,000 km
DF-5B (CSS-4 Mod 3)	10	12,000-15,000 km
DF-41 (CSS-X-20)*	N/A	12,000-15,000 km
Intermediate Range Ballistic Missiles		
DF-3A (CSS-2 Mod)	2	2,650 km
Medium Range Ballistic Missiles		
DF-21/21A (CSS-5 Mod 1/2)	80	1,770 km
DF-21C (CSS-5 Mod 3)	36	1,700 km
DF-21D (CSS-5 Mod 4 – ASBM)	18	1,500 km
DF-16	12	800-1,000 km
Short Range Ballistic Missiles		
DF-11A/M-11A (CSS-7 Mod 2)	108	280-350 km
DF-15B (CSS-6 Mod 3)	81	600 km
Land Attack Cruise Missiles**		
CJ-10 (DH-10)	54	1,500+ km
Submarine Launched Ballistic Missiles		
JL-1 (CSS-N-3)	12	2,150 km
JL-2 (CSS-NX-4)*	N/A	7,200 km
Total	514+	

*Currently in development and capable of carrying MIRVs.¹¹

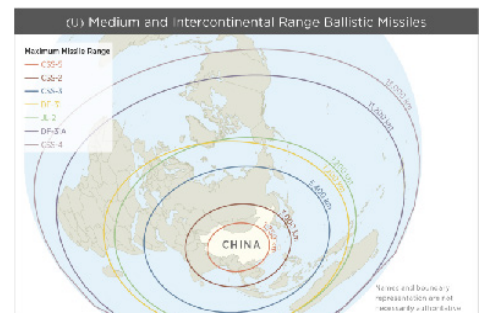
**US intelligence states that Chinese land attack cruise missiles (LACM) can be armed with a nuclear warhead but are not.¹²

Notes:

This table only displays the type and number of ballistic missiles that are capable of carrying a nuclear warhead and does not represent the number of warheads China has in its arsenal, nor does it take into account the number of launch vehicles such as SSBNs, aircraft capable of deploying a nuclear warhead, and ballistic missiles with more than one warhead.



JL-2 SLBM. Wikimedia commons.



Chinese missile ranges. DoD image.



DF-5B ICBM final stage. Wikimedia commons.

Current Modernization of the Triad

- The People's Liberation Army has possessed a triad since 1982 following the successful test of its submarine launched ballistic missile.
- The Second Artillery Force is increasing the survivability of its land forces by creating more mobile delivery systems with MIRV capabilities.¹³
 - The April 12, 2016 test of the DF-41, China's newest ICBM with MIRV capabilities,^{14 15} confirms this development and indicates that it will replace DF-31 models since they can only hold one warhead and use liquid fuel propellant.¹⁶
- China's relatively few nuclear tests indicate that it has been satisfied with the warhead designs that it has implemented in its arsenal.
 - Because of this, modernization has only been concerned with the deliverability of a warhead and less on effectiveness of the warhead itself.
 - Deliverability improvements are apparent in the increase in striking range and in the promptness of launch (i.e. switching from liquid to solid fuel).
 - Switching to solid from liquid fuel will decrease launch times but, since the warheads are separated from the missile, it will not contribute to the country's deterrence significantly.
 - Additionally, the switch to solid fuel has been slow and has occurred over a 30-year period, but most of its modern missiles like the DF-21, DF-41, and DF-5A are solid fueled.¹⁷
- If China were to build more warheads, it is severely limited by the amount of fissile material that it has available in stock.
 - Although PRC has stopped the production of military grade plutonium since the late 1980's, the country can resume this activity relatively quickly especially since it has expanded the number of reprocessing plants and fast breeder reactors.¹⁸
 - A contributing factor to this limitation is the design of the actual warhead itself and the amount of plutonium available in stock.
 - With only 2 ± 0.5 tons of plutonium,¹⁹ and production of fissile material at a standstill since the late 1980s, any increase in stock can be from a few to several hundred warheads.
 - These numbers are widely dispersed because it is dependent upon whether China wants to have missiles with a single warhead with yields in megatons damage, or have MIRV warheads with yields ranging in kilotons.
 - Prior to signing the Comprehensive Test Ban Treaty in 1999, the PRC tested a warhead of several kilotons, but analysis conducted by General John M. Shalikashvili for President George W. Bush indicated that it is too large for the DF-31,²⁰ yet small enough for the DF-41.

- China's JIN-class SSBN's will soon be equipped with the JL-2.
 - The deployment of the new SLBM will effectively give the PLA Navy a long-range sea-based nuclear deterrent but the Jin-class SSBN will lack the stealth capabilities of its Ohio and Borei class counterparts.²¹
- The PRC's bomber leg of the triad has been given the least effort in modernization.
 - Serving both nuclear and conventional roles, it is difficult to estimate how many aircraft are designated for nuclear only missions.
 - Previously, China designated certain production versions of the Xian H-6 as "nuclear bomber" like the A and E, and possibly the H and M models.^{22 23}
 - Additionally, the new H-6K strategic bomber's primary purpose is to target American carrier groups and other targets in the east Asia region.²⁴
 - The introduction of the H-6K into the PLA Air Force (PLAAF) is a leap for the PRC.
 - This new long range, standoff bomber can be armed with the six CJ-10A cruise missiles and can be refueled twice in the air but still lacks the range to target the US mainland.²⁵

Current Nuclear Strategy

- According to the 2015 *Chinese Military White Paper*, China still maintains its NFU policy and still adheres to a, "self-defensive nuclear strategy that is defensive in nature" that will, "deter other countries from using or threatening to use nuclear weapons against China."²⁶
 - The PLA Second Artillery Force (PLASAF) continues its missions of strategic deterrence and counter attack with "medium- and long-range precision strikes."²⁷
 - Retaliatory capability is key to prevent foreign military coercion.
 - Assured retaliation is the act of "detering an adversary with the threat of unacceptable damage through a retaliatory nuclear strike."²⁸
- NFU position is supported by a lack of high alert status in regards to its nuclear arsenal.
 - Unlike other nuclear weapon states, China's nuclear warheads and launch vehicles are kept separate and only mated when ready to be launched.
- Despite their limited arsenal, Chinese military experts believe that any attempt to coerce China's military with nuclear weapons will not be credible because of the adversaries' inability to effectively deny it a second strike capability.²⁹
 - Countries like Russia and the United States may become more confident as satellite and missile defense systems improve over the coming years.

- The secrecy that the PLA places on its nuclear weapons program is deceptive.³⁰
 - The lack of transparency strengthens its position that its nuclear forces are survivable.
 - Public access to this information would undermine its deterrence and make it susceptible to coercion by either Russia or the United States.
 - Coercion results from the superiority of Russia and the United States in their ability to strike with precision and the advantage in number of nuclear warheads.
 - The PLA's relatively few weapons and their low-alert status already create strategic vulnerability on their part and further information about the exact nature of their nuclear strategy (i.e. exact number of warheads, deployment of both warheads and missiles, and potential targets) would exacerbate this.
 - Recent documentation created by the PLASAF for educational purposes shows that this branch of military is preparing for the possible use of nuclear weapons to prevent a foreign military from taking conventional military actions against China's urban population and key infrastructure.³¹
 - Since only the government leadership (and not the PLASAF) dictates nuclear policy, it is still unclear what strategy the PLA would pursue.
 - This follows one of the *Thirty-Six Stratagems*, "Make a sound in the east, then strike in the west."
 - Here, the strategy is that when different minds are speaking at once, the adversary cannot be sure which speaks for the whole.
- In addition to modernizing the weapons themselves, the PRC has taken lengths to strengthen its command control communication and intelligence (C3I) capabilities to further ensure a second strike.³²
 - According to the 2015 US Department of Defense report, improvements in this field will allow the PLASAF "to ability to command and control multiple units in the field"³³ and will give ICBM units to have "access to battlefield information, uninterrupted communications connecting all command echelons, and unit commanders are able to issue orders to multiple subordinates at once... via voice commands."³⁴
- Size of nuclear stockpile is unknown due to the PLA's extensive use of underground tunnels.
 - The total length of tunnels could stretch for over 5,000 km.³⁵
 - Tunnels have decoy tunnel portals to prevent adversaries from launching a successful first strike.³⁶
 - These steps were taken following the successful air war waged by coalition forces in the 1991 Gulf War and later expanded after the 1999 NATO intervention in Kosovo.

Conclusion

China's modernization efforts in its triad has sparked a debate as to whether or not the country is moving away from its strategy of assured retaliation to a more offensive one.

The development and deployment of road-mobile, solid-fuel ICBMs, and the construction of underground tunnel systems, reinforces the notion about China's efforts to hide, rather than display their nuclear weapons is an indicator of that it seeks to ensure second strike capabilities.

Additionally, the lack of high-alert status of all land-based missiles reveals that it does not place high priority on first strike capacity.

The development of ICBMs and a SSBN capable of striking the United States mainland suggests that China's strategy of assured retaliation is not only directed towards its immediate neighbors but those across the Pacific as well.

This, coupled with the ambiguous and unclear declaratory strategy of its NFU, could lead to unwanted escalation during a crisis between both countries.³⁷ In the event of a conflict between PRC and the United States, the latter could take steps that could threaten the national security of China such as the destruction of the Three Gorges Dam. The overall success could prompt a nuclear response from China. This can be avoided if the Chinese leadership makes more declaratory policies as to what could specifically would constitute a nuclear retaliation.

Observers should be wearier of nuclear specific weaponry or modernization efforts that would represent a dramatic shift in China's nuclear strategy. The development of an ABM system, the hardening or mobilizing of land-based nuclear assets, and/or increasing the alert state and readiness of warheads, would be perceived as inherently destabilizing and as an indication that the country is pursuing a first strike or counterforce strategy.

Endnotes

1. This states that China will never use nuclear weapons first against a nuclear-weapon state and that it will never use or threaten to use a nuclear weapon against a non-nuclear state.
2. Goebel, Greg. "Reconnaissance & Special-Mission Tu-16s / Xian H-6." *Air Vectors*. N.p., 01 Oct. 2014. Web. 02 Aug. 2016. http://www.airvectors.net/avtu16_2.html#m4
3. Lin, Chong-Pin. *China's Nuclear Weapons Strategy: Tradition Within Evolution*. (Lexington, Mass: Lexington Books, 1988. p47
4. Ibid, p48.
5. Depending on the exact number of CJ-10 ALCMs that the PLAAF has in its arsenal, it can range from nine to twenty-seven. This is reached based on the current bomber which can hold up six ALCMs and assuming a minimum of two for older models.

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8. “China Submarine Capabilities | NTI.” *China Submarine Capabilities | NTI*. Nuclear Threat Initiative, 15 July 2016. Web. 29 July 2016. <http://www.nti.org/analysis/articles/china-submarine-capabilities/>
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16. “DF-41 (CSS-X-10).” *Missile Threat*. Project of the George C. Marshall and Claremont Institutes, 12 Feb. 2014. Web. 29 July 2016. <http://missilethreat.com/missiles/df-41-css-x-10/>
17. Kulacki, p2.
18. Ibid, p1.
19. “China.” Nuclear Threat Initiative. James Martin Center for Nonproliferation Studies at the Middlebury Institute of International Studies, Apr. 2015. Web. 25 July 2016. <http://www.nti.org/learn/countries/china/>
20. Shalikhvili, John M. “Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty.” *Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty*. Federation of American Scientists, n.d. Web. 24 July 2016. http://fas.org/nuke/control/ctbt/text/ctbt_report.html
21. *The People’s Liberation Army Navy: A Modern Navy with Chinese Characteristics*. Suitland, MD: Office of Naval Intelligence, 2009. p22.
22. H and M models were arms with cruise missiles that could have been nuclear armed.
23. Goebel.
24. Axe, David. “The H-6K Is China’s B-52.” *War Is Boring*. War Is Boring, 08 July 2015. Web. 29 Aug. 2016. <https://warisboring.com/the-h-6k-is-china-s-b-52-64e1ce9b45eb#.cxnqxelle>

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We live in a time when the threats to our security are as complex and diverse as terrorism, nuclear proliferation, climate change, energy challenges, and our economic wellbeing. Partisan bickering and age old solutions simply won't solve our problems. America – and the world - needs an honest dialogue about security that is as robust as it is realistic.

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