V. Chinese nuclear forces

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China maintains an estimated total stockpile of about 270 nuclear warheads, a number that is slowly increasing. Of China's planned triad of land-, sea- and air-based nuclear forces, only the land- and sea-based ballistic missiles are currently considered operational. About 220 warheads are assigned to these forces. The remaining warheads are assigned to non-operational forces, including new systems that are under development, operational systems that may increase in number in the future and reserves (see table 11.6).

China continues to modernize its nuclear arsenal as part of a long-term programme to develop more survivable and robust forces consistent with its nuclear strategy of assured retaliation. The Chinese Government's stated goal is to 'strengthen [China's] capabilities for strategic deterrence and nuclear counterattack' by improving the 'strategic early warning, command and control, rapid reaction, and survivability and protection' capabilities of its nuclear forces.[1] In accordance with its self-declared minimum deterrence posture, China has focused on making qualitative improvements to its nuclear arsenal rather than on significantly increasing its size.[2]

At the end of 2015 the Chinese Government reorganized the country's nuclear forces as part of a wider move to restructure and modernize the military under a streamlined command system.[3] It replaced the People's Liberation Army (PLA) Second Artillery Force, which was responsible for maintaining custodial and operational control over China's nuclear warheads and land-based missiles, with a PLA Rocket Force (PLARF), which is also responsible for nuclear-capable aircraft and submarines. The PLARF becomes the fourth service in China's military, on an equal level with the PLA, PLA Navy (PLAN) and PLA Air Force (PLAAF).[4] While remaining the 'core force of strategic deterrence', the PLARF has also been put in charge of conventional missile systems and tasked with strengthening China's medium- and long-range precision strike capabilities.[5]

Chinese officials have emphasized that the creation of the PLARF does not presage changes to the country's nuclear strategy or posture. China

[1] Chinese State Council, *China's Military Strategy*, White Paper, section 4 (Information Office of the State Council: Beijing, May 2015).

[2] Cunningham, F. and Fravel, M. T., 'Assuring assured retaliation: China's nuclear posture and US-China strategic stability', *International Security*, vol. 40, no. 2 (Fall 2015), pp. 12–15.

[3] Chinese Ministry of National Defense 'China establishes Rocket Force and Strategic Support Force', 1 Jan. 2016; and Tiezzi, S., 'The new military force in charge of China's nuclear weapons', *The Diplomat*, 5 Jan. 2016.

[4] Zhang, H., 'New PLA Rocket Force conducts desert, forest drills', Global Times, 5 Jan. 2016.

[5] Chinese Ministry of National Defense (note 3). See also Cordesman, A., 'The PLA Rocket Force: evolving beyond the Second Artillery Corps (SAC) and nuclear dimension', Center for Strategic and International Studies, Working draft, 13 Oct. 2016, pp. 3–5.

Table 11.6. Chinese nuclear forces, January 2017

Type/Chinese designation (US designation)	Launchers deployed	Year first deployed	Range (km)[a]	Warheads x yield	No. of warheads[b]
Land-based ballistic missiles[c]	*150*[d]				*170*
DF-4 (CSS-3)	10	1980	5 500	1 x 3.3 Mt	10
DF-5A (CSS-4 Mod 1)	10	1981	12 000+	1 x 4–5 Mt	10
DF-5B (CSS-4 Mod 2)	10	2015	12 000	3 x 200–300 kt	30
DF-5C (CSS-4 Mod 3)	..	..	..	MIRV	..
DF-15 (CCS-6 Mod 1)	..	1994	600	(1 x 10–50 kt)	..[e]
DF-21 (CSS-5 Mods 1/2)[f]	80	1991	2 100f	1 x 200–300 kt	80
DF-26 (CSS-. .)	8	(2017)	>4 000	1 x 200–300 kt	8
DF-31 (CSS-10 Mod 1)	8	2006	>7 000	(1 x 200–300 kt)	8
DF-31A (CSS-10 Mod 2)	25	2007	>11 200	(1 x 200–300 kt)	25
DF-41 (CSS-X-20)	..	..	(12 000)	MIRV	..
Sea-based ballistic missiles[h]	*48*				*48*[g]
JL-2 (CSS-NX-14)	48	(2016)	>7 000	(1 x 200–300 kt)	48
Aircraft[i]	*(20)*				*(20)*
H-6 (B-6)	(20)	1965	3 100	1 x bomb	(20)
Attack (. .)	..	1972–..	..	1 x bomb	..
Cruise missiles	*150–**350***				..
DH-10 GLCM[j]	150–350	2007	>1 500	1 x ..	..
CJ-20 ALCM	..	(2014)	>1 500	1 x ..	..[k]
Total	**218**				**270**[l]

.. = not available or not applicable; ( ) = uncertain figure; ALCM = air-launched cruise missile; GLCM = ground-launched cruise missile; kt = kiloton; Mt = Megaton; MIRV = multiple independently targetable re-entry vehicle.

[a] Aircraft range is for illustrative purposes only; actual mission range will vary according to flight profile and weapon loading.

[b] Figures are based on estimates of 1 warhead per nuclear-capable launcher, except the MIRVed DF-5B, which is estimated to have 3 warheads. The warheads are not thought to be deployed on launchers under normal circumstances but kept in storage facilities. All estimates are approximate.

[c] China defines missile ranges as short-range, <1000 km; medium-range, 1000–3000 km; long-range, 3000–8000 km; and intercontinental range, >8000 km.

[d] The estimate only counts nuclear launchers. Some launchers might have 1 or more reloads of missiles.

[e] The US Central Intelligence Agency concluded in 1993 that China had 'almost certainly' developed a warhead for the DF-15, although it is unclear whether the capability was ever fielded.

[f] The range of the nuclear DF-21 variants (CSS-5 Mods 1 and 2) is thought to be greater than the 1750 km normally reported.

[g] The estimate is based on the assumption that warheads have been produced for the JL-2 submarine-launched ballistic missiles (SLBMs) on China's 4 Type 094 (Jin class) nuclear-powered ballistic missile submarines (SSBNs). The operational status of the missile is unclear.

[h] The JL-1 SLBM, which dates from the 1980s, is no longer considered to be operational.

[i] Chinese aircraft do not currently have a nuclear mission but China has conducted several nuclear weapon tests using bombers (and 1 using a fighter) and has displayed models of nuclear bombs in military museums. On this basis, SIPRI estimates that some residual nuclear capability exists.

[j] The US Air Force, National Air and Space Intelligence Center (NASIC) lists the DH-10 as 'conventional or nuclear', the same designation used for the Russian nuclear-capable AS-4.

[k] US Air Force Global Strike Command lists the CJ-20 as nuclear-capable; NASIC does not.

[l] As well as the *c.* 220 warheads thought to be assigned to operational forces, a further 50 or so warheads are thought to be in storage or production to arm additional DF-26s and future DF-41 missiles. The total stockpile is believed to comprise *c.* 270 warheads and is slowly increasing.

Sources: US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat*, various years; US Air Force Global Strike Command; US Central Intelligence Agency, various documents; US Defense Intelligence Agency, various documents; US Department of Defense, *Military and Security Developments Involving the People's Republic of China*, various years; Kristensen, H. M., Norris, R. S. and McKinzie, M. G., *Chinese Nuclear Forces and US Nuclear War Planning* (Federation of American Scientists/Natural Resources Defense Council: Washington, DC, Nov. 2006); 'Nuclear notebook', *Bulletin of the Atomic Scientists*, various issues; Google Earth; and authors' estimates.

remains committed to its no-first-use policy on nuclear weapons and will keep its 'nuclear capability at the minimum level required for safeguarding its national security'.[6] The Chinese Government has also given no indication that it will change its long-standing policy of maintaining nuclear forces at a low alert level in peacetime, despite internal discussions within the Chinese military about raising the alert level and moving towards a more launch-ready posture.[7]

Land-based ballistic missiles

China's nuclear-capable land-based ballistic missile arsenal is undergoing gradual modernization as China replaces ageing silo-based, liquid-fuelled missiles with new mobile solid-fuelled models. China's shift towards more survivable mobile missiles has been motivated by concerns that US advances in intelligence, surveillance and reconnaissance (ISR) capabilities and in precision-guided conventional weapons pose a pre-emptive threat to fixed missile launch sites and supporting infrastructure.[8]

In its most recent annual report on Chinese military developments, the US Department of Defense (DOD) estimated that China deployed 75–100 intercontinental ballistic missiles (ICBMs) in 2016.[9] The silo-based, liquid-fuelled, two-stage Dong Feng (DF)-5A and the road-mobile, solid-fuelled, three-stage DF-31A are currently China's longest-range operational ICBMs.

[6] Xinhua News Agency, 'China's nuclear policy, strategy consistent: spokesperson', 1 Jan. 2016.

[7] See Kulacki, G., *China's Military Calls for Putting its Nuclear Forces on Alert* (Union of Concerned Scientists: Cambridge, MA, Jan. 2016); and Zhao, T., 'Strategic warning and China's nuclear posture', Carnegie–Tsinghua Centre for Global Policy, 28 May 2015.

[8] O'Connor, S., 'Sharpened Fengs: China's ICBM modernisation alters threat profile', *Jane's Intelligence Review*, vol. 27, no. 12 (Dec. 2015), pp. 44–49.

[9] US Department of Defense (DOD), *Military and Security Developments Involving the People's Republic of China 2016*, Annual Report to Congress (DOD: Washington, DC, May 2016), p. 25.

After many years of research and development, China has modified a small number of ICBMs to deliver nuclear warheads in multiple independently targetable re-entry vehicles (MIRVs). China has prioritized the deployment of MIRVs in order to improve its warhead penetration capabilities in response to advances in US and, to a lesser extent, Indian missile defences.[10] The missile identified as being MIRV-equipped is a modified version of the DF-5A ICBM, designated the DF-5B. Some analysts have speculated that the deployment of MIRVs on the ageing, silo-based DF-5B may be an interim arrangement necessitated by delays in the development of the DF-41 mobile ICBM, which is widely expected to carry MIRVed warheads.[11]

China is developing the DF-41 ICBM which, like the DF-5A, will be able to strike targets throughout the entire continental USA. The development work on the DF-41, which has both rail- and road-mobile versions, appears to be at an advanced stage, but it is unclear when the missile will enter into service.[12] The PLAAF carried out a flight test of a DF-41 ICBM, apparently carrying two dummy warheads, in the South China Sea on 12 April 2016, the seventh such test since 2012.[13]

Ballistic missile submarines

China continues to pursue its long-standing strategic goal of developing and deploying a sea-based nuclear deterrent. The PLAN has built a new class of nuclear-powered ballistic missile submarine (SSBN), the Type 094.[14] According to the US DOD's 2016 annual report on China's military power, four Type 094 SSBNs are currently operational, and a fifth boat is under construction and expected to enter service by 2020.[15] The Type 094 submarine will be armed with up to 12 three-stage, solid-fuelled JL-2 SLBMs. The JL-2 is a sea-based variant of the DF-31 ICBM with an estimated maximum range exceeding 7000 kilometres and is believed to carry a single warhead.

There has been considerable speculation about when a Type 094 SSBN carrying nuclear-armed JL-2 SLBMs will begin deterrence patrols. The annual US DOD reports have predicted since 2014 that commencement of

[10] See Lewis, J., 'China's belated embrace of MIRVs', eds M. Krepon et al., *The Lure and Pitfalls of MIRVs: From the First to the Second Nuclear Age* (Stimson Center: Washington, DC, May 2016), pp. 95–99.

[11] Minnick, W., 'Chinese parade proves Xi in charge', *Defense News*, 6 Sep. 2015.

[12] Fisher, R., 'China developing new rail-mobile ICBM, say US officials', *Jane's Defence Weekly*, 23 Dec. 2015.

[13] Gertz, B., 'China confirms multiple-warhead missile test in South China Sea', Washington Free Beacon, 21 Apr. 2016.

[14] The Type 094 SSBN is designated the Jin class by the United States and NATO.

[15] US Department of Defense (note 9), pp. 26, 58; US Navy, Office of Naval Intelligence (ONI), *The PLA Navy: New Capabilities and Missions for the 21st Century* (ONI: Washington, DC, 2015); and Kristensen, H. M., 'China SSBN Fleet getting ready: but for what?', FAS Strategic Security Blog, Federation of American Scientists, 25 Apr. 2014.

patrols by submarines armed with nuclear missiles is imminent, but there was no evidence in 2016 that such patrols had begun.[16] Some analysts have speculated that the PLAN's delay in commencing deterrence patrols might reflect its concern that the relatively high noise level of the Type 094 submarine means that it can be readily tracked by opposing naval and air forces.[17] The PLAN is expected to begin developing its next-generation SSBN, the Type 096, in the coming decade. The Type 096 will reportedly be armed with a successor to the JL-2, the JL-3 SLBM.[18]

Aircraft and cruise missiles

The PLAAF is believed to maintain a small number of nuclear gravity bombs to be delivered by the Hongzha-6 (H-6) medium-range bomber and potentially also a shorter-range combat aircraft. In 2016 the PLAAF confirmed reports in the Chinese state media that it was building a long-range strategic bomber.[19] According to Chinese military sources, the aircraft, known as the H-20, will have stealth characteristics comparable to those of the US B-2 bomber.[20] The PLAAF was reportedly assigned a 'strategic deterrence' mission in 2012.[21] However, it has not confirmed that the new aircraft will have a nuclear role.

The PLA deploys several types of cruise missile. However, only the ground-launched Donghai-10 (DH-10, also designated Changjian-10, CJ-10) has been reported as being nuclear capable.[22] Although not explicitly confirmed in official Chinese sources, sea-launched and air-launched versions of the DH-10, sometimes referred to as derivatives of the DH-10, also appear to be in development.[23]

[16] Stewart, V. R., Director, US Defense Intelligence Agency, Statement for the Record: Worldwide Threat Assessment, Armed Services Committee, US Senate, 9 Feb. 2016.

[17] Tate, A., 'China may be struggling to establish a sea-based nuclear deterrent', *Jane's Defence Weekly*, 8 June 2016, p. 4; and Borger, J., 'China to send nuclear-armed submarines into Pacific amid tensions with US', *The Guardian*, 26 May 2016.

[18] US Department of Defense (note 9), p. 26.

[19] China Military Online, 'PLA Air Force commander confirms new strategic bomber', 3 Sep. 2016; and Zhao, L., 'Long-range bomber may be in China's plans', *China Daily*, 7 July 2015.

[20] Tate, A., 'Details emerge about requirement for China's new strategic bomber', IHS Jane's 360, 21 Dec. 2016.

[21] US Department of Defense (note 9), p. 38.

[22] The US Air Force refers to the DH-10 as 'conventional or nuclear', the same designation as the Russian AS-4, Pakistani Babur and Indian Ra'ad cruise missiles, which are known to be dual-capable. US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat*, NASIC-1031-0985-13 (NASIC: Wright-Patterson Air Force Base, OH, 2013), p. 29.

[23] The air-launched version is designated Changjian-20, CJ-20.