China's Ballistic Missile Capability and India's Preparedness

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US intelligence infrastructure maintains a hawk's eye on China's nuclear arsenal. Yet, despite its consistent monitoring of the developments, reams of analyses of the Chinese nuclear strategy, and repeated requests for nuclear transparency, Dennis Wilder, Senior Director for East Asian Affairs on US National Security Council, in January 2009, described Chinese nuclear strategy and doctrine as "*really a black box.*"[1] Indeed, ambiguity and secrecy in numbers and capability have always been important attributes of China's nuclear strategy.

More recently though one can discern a certain amount of display of its missile prowess. The annual military parades have not been shy of showcasing modern missiles. The Chinese media has extensively reported missile tests, often extolling the virtues of the new capabilities. This indicates that China is enjoying a greater sense of confidence in its strategic capability owing to a consistent and focussed modernisation. China's current version of nuclear deterrence appears to be more credibly derived from the mobility, accuracy and penetrability of its growing numbers and range of ballistic missiles[2]. The Second Artillery Corps is the repository of this capability and the last few Chinese White Papers on National Defence have put explicit emphasis on exhibiting deterrence through the rapid, integrated and effective use of ballistic and cruise missiles. It is, therefore, pertinent that India accords due importance to these instruments

of war. This paper restricts itself to identifying the trends in China's ballistic missile modernisation in order to provide pointers for India's own capability and preparedness.

Ballistic Missiles for Credible Nuclear Deterrence

Acquisition of nuclear weapons is meaningless unless accompanied by credible delivery systems. The Air Force has traditionally been the first available delivery platform in every nuclear armed state. However, given the limitations and vulnerabilities of air delivery, nations have looked at ballistic missiles – ground or sea launched – to finally become the sword arm of their nuclear arsenal. So has it been with China too. A modest force of 100 H-6 bombers capable of carrying three bombs each over 3,100 km and an even smaller fleet of 30 Q-5 aircraft that could carry one bomb each over 400 km constituted the first delivery platforms. But, this was obviously inadequate, given the short range of the aircraft and their inability to penetrate enemy air defences. More recently, China has inducted the H-6K bombers of greater range and combat payload. Armed with long-range cruise missiles, the H-6K, even though a sub-sonic bomber, is now believed to have the operational capability to project nuclear deterrence.[3] In the meantime, however, China's ballistic missile capability has developed into a potent deterrent force.

China's efforts at building its nuclear and missile arsenal and the attendant capabilities have been undertaken keeping a keen eye on the development and deployment of the American Ballistic Missile Defence (BMD). In fact, the trajectory of China's missile modernisation provides a clear indication of the efforts being made to defeat or negate the BMD and its theatre based variants in East Asia or atop American ships.

Trends in China's Missile Modernisation

Seven areas stand out in China's process of missile modernisation. In fact, the manner in which the missile capability is being developed provides several interesting indicators about the country's nuclear strategy and the possible choices that could be made in conventional warfare too.

Focus on Missiles Rather than Nuclear Warhead Numbers

Amongst the most apparent trends in China's strategic modernisation is the focus on delivery vectors rather than an increase in the numbers of nuclear warheads. Estimates about China's nuclear numbers vary from 200 to 450. But

Increasing number of nuclear missiles is Chinese philosophy of defeating US BMD

none of the intelligent guesstimates (in the absence of any Chinese official disclosures) talk of numbers beyond this. Of course, and it is rather interesting, that American Defence Intelligence Agency (DIA) assessments or other Pentagon reports claim a sharp rise in numbers year after year. Some even estimate an increase in nuclear warheads to as many as 1,000 by 2016. However, such an increase is not known to have materialised. In fact, the *Bulletin of Atomic Scientists* has consistently placed the numbers at a conservative figure of 250.[4]

This tendency to place less emphasis on the nuclear warhead stockpile may be attributed to the Chinese understanding of this weapon as a political tool of deterrence, which obviates the need for nuclear superiority, or parity. Having designated a *defensive counter-strike role* for its nuclear forces, the arsenal only has to be *smart enough* to survive a possible first strike and *big enough* to cause "unacceptable damage". Of course, the American national and theatre missile defences alter China's ability to cause 'unacceptable damage'. Even so, more than an increase in absolute numbers of warheads, China is seen building missiles capable of greater survivability and equipped with counter-measures to defeat the BMD.

Increase in Missile Numbers

A salvo launch of missiles from a variegated range of azimuths can severely stress the BMD architecture. Therefore, increasing the numbers of missiles is the easiest and the most feasible option to defeat missile defence and China is known to have simply increased the numbers of its missiles as one way of defeating the US BMD. One analyst has described this multi-directional and multi-layered saturation strategy as being "reminiscent of China's Korean War 'human wave' tactics"[5].

The most rapid increase is evident in the land-based missiles of short and medium ranges. In the latter category are the DF-21s and the DF-21As with a range of 1,750 to 2,150 km. The inventory of these missiles, according to the American intelligence community estimates, has grown four times from about 20 to 100 between 2006 and 2011[6]. Short Range Ballistic Missiles (SRBMs) have also proliferated in the conventional role. Nearly 1,300 small and medium missiles are believed to have been deployed to take care of contingencies in Taiwan. Meanwhile, the increase in the Intercontinental Ballistic Missiles (ICBMs) has been less remarkable. Out of a total ICBM force of 60 missiles, it is estimated that currently

about 40 of the DF-5As (13,000 km range) and DF-31As (11,000 km range) can strike the US mainland. However, with the BMD in mind, some Chinese scholars like Shen Dingli have calculated the need for a "nine-fold increase" in Chinese ICBMs. This, however, may not happen in a hurry, if at all, since China is adopting a practical strategy of enhancing the deterrent effect of its nuclear capable ballistic missiles in ways that are less dependent on numbers alone.

In fact, though the numbers of Chinese missiles have indeed increased from about a decade ago, this has been more a result of the development of newer and more hardy variants of some of the earlier missiles, which are due to be retired, but are still in service for the time being. Overall, China appears to be playing the numbers game very cautiously to consciously avoid a missile race. It has learnt its lessons from the Soviet experience. Consequently, its efforts are inclined towards building more sophisticated capabilities that can exploit the chinks in the US armour.

Improvements in Survivability of Ballistic Missiles

In order to enhance the survivability of its strategic forces, China has moved from largely liquid fuelled and, hence, vulnerable missiles to solid fuelled and more mobile versions on road or rail launchers. Mobility adds to complications for a first strike despite the US advantage of Intelligence, Surveillance, Reconnaissance (ISR) through its space assets.

In order to further mitigate the vulnerability of land-based missiles, China has aggressively pursued an operational sea-based deterrent capability. As was once stated by Adm Liu Huaqing, "In the face of a large scale nuclear attack, only less than 10 per cent of the coastal launching silos will survive, whereas submarines armed with ballistic missiles can use the surface of the sea to protect and cover themselves, preserve the nuclear offensive force and play a deterrent and containment role."[7] The sea leg of the Chinese nuclear triad is expected to credibly rest on the Julang 2 (JL 2), a second generation, 7,000-km-range Sea-Launched Ballistic Missile (SLBM) that would be deployed on an indigenous Type 094 submarine, three of which are currently in service, though minus operational missiles for the moment. One Xia class SSBN (nuclear powered ballistic missile equipped submarine) with 12 JL 1 missiles of 1,700 km range has been in service since 1988. But given its problems of high noise levels, radiation leaks and the ability to carry only short range missiles with a single warhead, it never constituted a viable second strike deterrent and is expected to be retired soon [8]. But the new Jin class of submarines armed with longer range SLBMs, 12 on each of the three

such boats in service, would give the People's Liberation Army Navy (PLAN) a more credible sea-based nuclear deterrent.

Chinese nuclear missiles have enhanced accuracy due to external threat and improved indigenous technology

Improving Missile Accuracies

With a nuclear strategy premised on retaliation to cause unacceptable damage, China was in the past satisfied with not very highly accurate ballistic missiles. However, the domestic technology push, as well as the external threat pull, have drawn China's missiles towards greater accuracy. Microminiaturisation of electronics has allowed onboard computers on missiles, besides the increasing availability of more sophisticated guidance through uplinking with satellites. Enhancement of missile accuracies provides China with the ability to conventionally attack the enemy's ground-based radars or other components of the Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) structure thereby opening up the possibility of using missiles in a counter-force mode instead of having a compulsory dependence on counter-value targeting. In fact, the ability to undertake mixed targeting would be used by China for buttressing the credibility of its deterrence and effectively increasing ambiguity. That this would also raise risks of misperception is another matter. Meanwhile, this trend has an implication for conventional war too. Accurate conventional missiles offer the flexibility of operational deployment, including defeating sea-based BMD. Conventional missiles could saturate the finite number of interceptors available on a ship and damage or destroy it fatally.

Development of MIRV and MARV Technology

While it is assumed that China presently does not deploy multiple warheads on a single missile, it reportedly has had the capability to do so for at least a decade. A report in December 2002 announced the test of the DF-21 Medium Range Ballistic Missile (MRBM), with multiple warheads, a capability considered essential to enhance China's nuclear deterrence against BMD.[9] China is known to have been miniaturising warheads to make them lighter and easier to deploy in multiple numbers. Meanwhile, it has also been developing and testing manoeuvring warheads to evade interception even in the terminal stages. The DF-21D anti-ship ballistic missile is of significance in this context. It is attributed with a capability to perform mid-course manoeuvres and yet guide the payload to the target with the help of terminal guidance enhancing its accuracy. It can be a

game changer owing to its ability to hit mobile ships with Manoeuvrable Reentry Vehicles (MaRVed) missiles equipped with a combination of radar and optical sensors. This Anti-Access or Area Denial (A2AD) strategy poses a challenge to the American air sea battle concept and, thus, increases China's deterrence, especially in the case of possible Taiwan related scenarios.

Emphasis on Operational Issues

The Second Artillery Corps (SAC) has been tasked with the three-fold mission of deterrence, supporting conventional war with ballistic missile attacks, and nuclear counter-attacks. In support of these tasks, the Chinese White Paper on National Defence (WPND) of 2008 underlined the need to "build a streamlined and effective strategic force by raising the informationisation of weaponry and equipment systems, build an agile and efficient operational C2 and increase capability of land-based strategic nuclear counterstrikes and precision strikes with conventional missiles". Exercises to test reliable communications, combat coordination, damage control, equipment repair and rapid launch have been conducted.[10] More recently, the Second Artillery is believed to have focussed on training and readiness of operational units, rapid reaction, Electronic Warfare (EW), and precision attacks. In 2010, the WPND further emphasised build-up of "capabilities in rapid reaction, penetration, precision strike, damage infliction, protection and survivability". These steps indicate an attempt to buttress deterrence through a greater projection of readiness to handle deterrence breakdown.

Ambiguity Through Contiguous C2 of Missiles

The *Science of Second Artillery Campaigns* articulates, "During future joint combat operations, Second Artillery Corps will not merely act as the main force in providing nuclear deterrence and nuclear counter-strike power, but will also act as the backbone force in conventional firepower assaults." Evidently and overtly then, China's nuclear and conventional missiles co-habit at the SAC. In fact, China has conventional versions of several missiles that are known to be nuclear capable and though this ambiguity is meant to add to China's nuclear deterrent, it is a move fraught with risks of misunderstandings, miscalculations and mistaken nuclear escalation. Highly accurate MARVed missiles that are dual use capable pose a complex challenge for countries that have a first use doctrine since they would face the dilemma of how quickly to respond without knowing the nature of the payload. If the attacker uses such missiles in salvo mode, mixing conventional and nuclear warheads, the situation becomes even more grim.

India's Preparedness

China's missile capability is undergoing a rapid and focussed modernisation enabled by its phenomenal economic growth. However, Beijing appears to be undertaking an intelligent process of modernisation based on a considered selection of capabilities keeping in mind the vulnerabilities of the enemy. It appears to have made the judgment that it needs to maintain a defensive orientation of the overall nuclear policy while preserving the flexibility for offence. The capability build-up clearly points in this direction.

What then are the implications of China's strategic modernisation for India? There is no doubt that China has a clear lead in nuclear and missile capability in terms of the number of nuclear warheads, the fissile material stockpile, the number of missiles, their range accuracy and counter-measures. While this could force India to face the prospect of a more assertive China in the coming years, it also raises the possibility, one could even say inevitability, going by past experience, of China transferring its modernisation benefits to Pakistan. Therefore, India's security concerns remain from the missile capabilities on both its borders. While ballistic missiles have traditionally been seen as most effective for nuclear delivery, accurate MARVed missiles can be potent weapons even with conventional warheads targeting India's nuclear capability. Conventional attacks on airfields or missile units could be crippling, while posing the additional dilemma of the manner in which India should respond.

Irrespective of how India responds at such time, it is clear that the present focus for the country should lie in modernising its own capability and buttressing its deterrence along the same lines as being done by China. On the one hand, it must build missile capabilities aimed at greater accuracy, manoeuvrability, penetrability and range enhancement. On the other hand, it needs to enhance the credibility of nuclear deterrence by increasing the survivability of its missiles. Just as China sows doubt in the US mind that its nuclear forces are invulnerable to a disarming first strike, and willing and capable of mounting a punishing second strike, India too has to underline that a nuclear attack by China would result in assured retaliation to cause unacceptable damage. Simultaneously, further improvements in the range and reliability of missiles, redundancy of the Command and Control (C2) systems and a clear articulation of a chain of command and succession are imperative. In fact, ironically enough, India has to follow pretty much the same path as China towards enhancing the credibility of its nuclear deterrence.

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Notes

1. "China's Nuclear Secrecy Worries US", *Daily Times,* January 16, 2009, http://www.dailytimes.com.pk/default.asp?page=2009/01/16/story_16-1-2009_pg4_10
2. For more on this, see Jonathan Pollack, "The Future of China's Nuclear Weapons Policy," in John Hopkins and Weixing Hu, eds., *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain and China* (La Jolla, CA: University of California, 1994), p. 163.
3. Andrei Chang, "China Attains Aerial Nuclear Strategic Strike Capability," http://www.spacewar.com, September 07, 2007.
4. Hans Kristensen and Robert S Norris, "Nuclear Notebook: Chinese Nuclear Forces, 2013", *Bulletin of the Atomic Scientists*, Vol.69, No.6, November-December 2013, pp. 79-85.
5. Wendell Minnick, "China's Anti-access Plans Worry US Navy", *Defense News*, March 24, 2008.
6. Kristensen and Norris, n. 4, p. 81.
7. As cited in J You, *The Armed Forces of China* (Canberra: Allen & Unwin, 1999), pp. 96-97.
8. For more on this, see Lin Changshneg, "The Combat Power of China's Nuclear Submarine", as quoted in Andrew S Erickson, "China's Future Nuclear Submarine Force: Insights from Chinese Writings", *Naval War College Review*, Winter 2007.
9. "China Successfully Tests Multi-Warhead Missiles", *Yomiuri Shimbun*, February 8, 2003.
10. Office of the Secretary of Defence, *The Military Power of the PRC, 2005* (Washington DC: OSD, 2006).