

China's Military Modernisation: Recent Trends

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ABSTRACT Since the assumption of Xi Jinping to the post of General Secretary of the Communist Party of China (CPC) in 2013, the People's Liberation Army has undergone numerous changes, both in its modernisation and organisation, that are meant to ensure that the PLA forces will be battle-ready. The modernisation aims for the PLA to acquire the latest technology and logistics that can lead the military to quick and decisive victories in any theatre of battle. This brief examines these institutional changes in China's military, which have also resulted in the PLA firmly coming under the control of the CPC, ensuring the loyalty of the PLA is always kept under check.

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INTRODUCTION

China's People's Liberation Army (PLA) has undergone dramatic changes since the first push of modernisation in the 1980s and 1990s. The modernisation involved constant updates of doctrine, while ensuring that the equipment and organisational structure were improved to better reflect the changing demands of warfare. Doctrinally, the PLA has moved away from the ideal espoused by the republic's founding father, Mao Zedong, of a major conflict with the Soviet Union—to one where the military would be more heavily involved in localised conflicts.¹ As the Chinese Defence Minister Zhang Aiping observed in 1983: "The principle of war is to achieve the greatest victory at the smallest cost. To achieve this we should depend not only on political factors, but also on the correct strategy and tactics of the war's commander, the sophisticated nature of our military equipment, the quality of our personnel who use the equipment etcetera."²

Learning the lessons from their war against Vietnam in early 1979, the PLA took serious steps in its reorganisation.³ Recognising the decreasing likelihood of a total war,⁴ the CMC under Deng Xiaoping instituted major changes between 1985 and 1995 in doctrine, organisation and equipment, while keeping in mind local, yet intensive wars.⁵ Some of these changes included greater emphasis on joint operations, production of indigenous equipment, and converting the overall PLA into a leaner and more efficient fighting force.

The Gulf War of 1990-1991 further changed Chinese perceptions on the nature of warfare. Seeing the decentralised command structure of the US military, combined with

the extensive use of technologies such as GPS,⁶ the PLA instituted further changes in its command structure to ensure that it was a technologically adept military, capable of merging existing technologies with new ones to keep itself on top of an ever-evolving battlefield. This has led to many changes in the application of technology within the PLA, resulting in turn in the overall improvement of their joint operational capacity, along with providing the latest equipment to the ground troops.

The four core areas of capability development and deployment are the PLA's land, air, naval, and nuclear-cum-ballistic missile forces. The phases of modernisation were first doctrinal, then organisational – the PLA had then to be entirely restructured in the late 1980s and thereafter made equipment acquisitions beginning in the early 1990s, along with the transformation of the entire force. Since the early 1990s, the PLA's force planners and strategists have recognised the importance of developing and deploying capabilities for theatre-level military contingencies. Indeed, its capabilities are potent today largely because of the fact that they are geared to managing potential conflicts around the Chinese periphery such as a cross-straits one with Taiwan⁷ and that along the Sino-Indian border. However, China is yet to develop the kind of unlimited force projection capabilities that the United States possesses, at least for the medium term.

This brief updates an earlier one published by ORF in 2017. Building on some of the most important insights that were shared at a recent ORF roundtable, this brief examines the latest developments in the PLA's

modernisation agenda, and answers some important questions: Why has this military modernisation taken place? Is China on the right track?

THE PEOPLE'S LIBERATION ARMY (PLA)

The 1979 Chinese military campaign against Vietnam exposed critical weaknesses in the domains of command, logistics and communications.⁸ The denial and the absence of close air support for the Chinese land offensives against Vietnam forced the PLA to rely more on artillery fire support as a substitute and laid bare a crucial gap in the PLA's effective prosecution joint operations.⁹ Taking lessons from this military failure, the CMC under Deng Xiaoping instituted far-reaching reforms that resulted in changes in the operational and organisational structures along with the provision of the latest equipment to the PLA.

First, the operational structure of the PLA was changed and the Chinese defence ministry was reorganised. The seven military regions in China were reorganised into five theatre commands: North, South, East, West and Central Theatre Command.¹⁰ With this reorganisation in theatre commands also comes that of the forces at the division level; the division-sized forces has given way to brigades with combined arms capabilities, with each brigade being assigned artillery units, along with air defence and combat support, and the infantry units.¹¹ To ensure that there are no problems in supporting this change in organisation on the ground, the PLA has also made improvements to the Teeth-To-Tail Ratio (TTR).¹² Within this TTR, the PLA has

undergone extensive modernisation in its support and logistics capabilities, using the latest technologies such as drones and UAVs in its efforts to quickly provide critical air support.

The PLA, in keeping with the need for more indigenous material, has ensured its army is given the best equipment, ranging from service pistols to tanks. This has resulted in the production of indigenous weapons¹³ such as the QBZ-95-1 and the QBZ-95B-1 5.8mm carbine assault rifle, along with the Type 05 Suppressed Submachine Gun. Also in service in the PLA's armoured corps are two tanks, ZTZ-99A and ZTZ-96A, with the latter being an upgraded second-generation tank. Another important addition to the PLA is the ZBD-04,¹⁴ the latest in the PLA infantry fighting vehicle range which provides the PLA with the capability to operate both as an independent vehicle and with other tanks in the PLA arsenal.

A major component of the PLA is its emphasis on using the latest technologies in providing their troops with all the necessary advantages. To meet this technological barrier, the PLA has begun research and invested large sums of money on next-generation weaponry and technologies such as quantum computing and Artificial Intelligence (AI). Some of this next-generation weaponry includes microwave energy weapons¹⁵ and railgun technology on their naval vessels.¹⁶ This investment in high-tech weaponry is indicative of China's overall doctrinal aim of gaining the maximum advantage in any wartime situation.

Another aspect of the PLA is looking at quality over quantity, emphasised through their modernisation drives and focused on

next-generation technology such as Quantum Computing in the fields of communications and radar technology. This emphasis on quality can also be seen in the reorganisation of the PLA into a more effective fighting force, equipped with the latest in tracking technologies, fully integrated with their indigenous navigational system, BEIDOU.¹⁷ Since the PLA does not have a lot of combat experience, it makes do with various simulations, mostly anti-NATO operations,¹⁸ for training purposes. This reorganisation also ensures that each brigade of the PLA is equipped with both combat-ready forces and units to provide logistical support.

THE PEOPLE'S LIBERATION ARMY NAVY (PLAN)

Among the most crucial areas of Chinese military modernisation is the expansion of its naval capabilities. The Gulf War of 1991 and the Taiwan Strait Crisis of 1995-1996 changed Chinese perceptions on having a competent navy to promote the country's maritime defence. The naval expansion was conducted in three phases. First is coastal defence—a “brown water defensive capability” of the immediate shoreline; second is to dominate areas up to the First Island Chain; and the third is a blue water navy going beyond the second island chain.¹⁹ It is today in the third phase of its naval expansion even as it continues to further strengthen its Anti-access and Area Denial (A2AD) capabilities.²⁰

The Chinese navy has made progress in both the surface and subsurface segment of its fleet. In the subsurface domain, the PLAN has acquired 12 Russian-made Kilo Class conventional submarines since the mid-1990s

and added four indigenously developed submarines. These include a Jin Class ‘Type 094’ nuclear powered ballistic missile submarine (SSBN) and a new Shang Class ‘Type 093/093’ nuclear attack submarine (SSN). The latest addition to the PLAN is the SSN dubbed the Song Class ‘Type 039/039G’²¹. Each of the Jin Class submarines will be equipped with 7,400-kilometre range JL-2 nuclear-armed submarine launched ballistic missiles (SLBMs). Notably, Chinese gains in the submarine domain are the by-product of Russian designs.²² While these capabilities reflect an advancement in the PLAN's subsurface nuclear fleet, there is a crucial weakness is China's dependence on Russia for critical subsystems and design engineering, if not entire platforms.

The Chinese navy's surface fleet has also been improved. The CMC has highlighted the fact that the PLA Navy is on course to have three conventional aircraft carriers, long with the construction to two nuclear powered carriers in the future. The PLA Navy already has two aircraft carriers, the *Liaoning* (of Soviet origin, completed by the PLAN) and the Type 002 (first indigenously produced carrier).²³ The air arm of the *Liaoning* can consist of a combination of 36 fixed wing and rotary wing aircraft including 24 J-15 fighters, six anti-submarine warfare helicopters, four airborne early warning helicopters, and two rescue choppers.²⁴

The PLAN's long-term ambitions include the acquisition of nuclear-powered carriers, resulting in two carrier strike groups operating in the Western Pacific and an additional two groups in the Indian Ocean.²⁵ These nuclear powered carriers will inevitably use

electromagnetic catapult systems for the launch of carrier-based fighter aircraft.²⁶ Notwithstanding an absence of experience in operating carriers, the PLAN's introduction of aircraft carriers provides additional weight to the Chinese navy's surface warfare capabilities.

THE PEOPLE'S LIBERATION ARMY AIR FORCE (PLAAF)

The PLAAF, too, has witnessed significant improvements in its capabilities. Changes in the PLAAF's fighter fleet have been evident since the 1990s, when the Air Force started acquiring a small number of fourth-generation fighters in 1996. However, weaknesses are also evident from internal PLA's assessments of some platforms of its fighter fleet.

Beginning in the mid-1990s and for a decade and a half, the PLAAF's numbers swelled to 30 percent of the force. By 2015, the size increased to roughly 51 percent of the fighter fleet of the PLAAF and will grow further to 62 percent by the current year.²⁷ It is estimated that the Chinese fourth-generation fighter fleet increased from 383 to 736 jets between 2010 to 2015 – a 92 percent jump in fighter air combat power.²⁸

Today China operates roughly 1,200 short-range fighters. In service in the PLAAF's fleet are some 400 J-7 fighters, which are reasonably efficient aircraft. Yet the J-7 fighter strength will decrease in numbers, replaced, as noted earlier, with more advanced fourth-generation jets. The PLAAF's current fleet strength stands at approximately 1,977 aircraft.²⁹

The PLAAF is also driven to developing stealth capabilities for a segment of its fighter fleet. As of July 2014, the PLAAF has tested

four prototypes for the J-20 and has undertaken a flight test of a second prototype of the J-31 with stealth features. Yet none of these jets has entered the production stage.³⁰ J-20's AL-31 engine is Russian built, and the Chinese have sought to substitute the AL-31 with their own engine called the *Taihang*. Yet they are still unsure of the *Taihang*'s reliability as compared to its Russian counterpart. Consequently, they are undertaking developmental tests for another engine dubbed the WS-15 as an indigenous replacement for the AL-31.³¹ More than the size of the Chinese Air Force, the crucial strength of the PLAAF lies in its establishment of a dense air defence network.³²

There has also been significant progress in the research and development of sixth-generation fighter aircraft within the PLAAF.³³ This sixth-generation aircraft is supposed to come equipped with its own auxiliary drones and artificial intelligence integration, while also providing the PLAAF with across-the-board developments in its basic systems.³⁴ This generation of fighter aircraft is supposed to be inducted into the PLAAF by 2035. This sixth-generation fighter jet is emblematic of the emphasis the PLA has been placing on the role of technology in the conflicts of the future and its importance as not only a force multiplier, but an instrument to ensure decisive victory at the lowest cost.

THE PEOPLE'S LIBERATION ARMY ROCKET FORCE (PLARF)

The PLARF (formerly known as the PLA Second Artillery Force) is the custodian and end-user of China's nuclear and missile forces. At its birth, the PLARF was tasked primarily

with operating nuclear tipped missiles. For several years, China's nuclear-armed missile arsenal was saddled with a range of problems such as poor accuracy, protracted launch schedules and a relaxed alert posture. However, they were compatible with Beijing's declared No-First Use (NFU) policy and a doctrine enshrining Credible Minimum Deterrence (CMD).³⁵ A combined CMD-NFU policy necessitates only a small missile force that is capable of surviving a first strike and retaliating against the enemy's counter value targets. However, the same restrictions are inapplicable to conventional strike missions, a role the PLARF was ordered to perform. These recent technological advances have improved the PLARF's strength in terms of survivability, accuracy and an invigorated capability for Chinese conventional missiles. Indian experts also agree that China is developing a strong second-strike nuclear capability, particularly vis-à-vis the US,³⁶ despite the limited size of its arsenal. Most independent analyses still support China's adherence to NFU and a limited arsenal. The focus is entirely on security, accuracy, reliability and assured delivery. However, important changes are taking place in these areas as well.

The deployment of Chinese nuclear-armed ballistic missiles continues apace in order for Beijing to maintain regional nuclear deterrence. In the long term, its conventionally armed, medium-range ballistic missile forces are undergoing rapid change for the conduct of high-intensity regional military operations. To sustain this effort, the missile component of China's regional military nuclear deterrent posture includes land-based nuclear-armed CSS-6 Mod 2 missiles.³⁷ Its conventional Medium Range Ballistic Missiles (MRBM)

consist of CSS-5 missiles.³⁸ Beijing's conventional missile capabilities are primarily directed against the adversary's logistical nodes, communication links, facilities, and regional military sites such as air and naval bases.³⁹

Complementing the modernised expansion of its nuclear and missile forces, Chinese space military capabilities are also being augmented. Today China deploys and operates a proven Kinetic Anti-Satellite capability. It is making significant investments in ballistic missile capabilities to destroy satellites in Geosynchronous Orbit (GEO) and its Satellite Navigation System named BEIDOU, is an integral part of its military planning.⁴⁰ The ground nodes of its space segment have also been expanded, with China establishing satellite tracking stations within the mainland and in states such as Pakistan, Namibia and Chile.⁴¹ In December 2015, following the Central Military Commission (CMC) reforms, the PLA reached a milestone establishing new services by first converting the Second Artillery into the PLA Rocket Forces (PLARF), which it complemented with the creation of PLA Strategic Support Force (PLASSF) that blends electronic, space and network warfighting capabilities into a single service.⁴² Integrating weapons and developing a networked capability into a single service represents progress. However, the question remains whether the PLA is capable of inflicting quick and decisive blows against any potential adversary through joint operations.

The PLARF has also been researching and developing newer delivery vehicles for its missile arsenal, investing heavily in Hypersonic Glide Vehicles (HGVs) as a faster

means of delivery. This vehicle, currently under testing, has been fitted on the latest DF-17 missile system of the PLARF.⁴³ While it is not yet in operation, the fact that the PLARF is in the process of developing better delivery systems is a cause for concern for many of the perceived adversaries of China, such as the United States or its much closer neighbour, India. These delivery systems also signal China's move towards next-generation weaponry, towards better quality of its weapons over quantity.

AN EVALUATION OF THE PLA DOCTRINE AND COMBINED ARMS WARFARE CAPABILITIES

How do these Chinese capabilities fit into assessments (whether Chinese, Indian or other), about the PLA's emerging doctrine and operational posture? What possibilities exist for jointness for the PLA and its supporting arms? Indian assessments of the PRC's emerging order of battle correlates strongly with the preceding sections on Chinese military strength measured in terms of actual military capabilities. From an Indian standpoint, Chinese modernisation since the initiation of military reforms is concentrated in two areas.

Despite improvements in the TTR discussed earlier, important challenges continue to face the PLA in the areas of jointness and efficiency. Optimising the fighting force to undertake combined arms warfare is a hurdle and remains a critical weakness. Command and Control (C2) for the conduct of joint operations is a universal problem in modern warfare.⁴⁴ A change in the PLA's warfighting doctrine stands in

contradiction to the structures within which it is being operationalised.⁴⁵ The doctrine stresses decentralisation, whereas the operational culture of the PLA focuses on centralisation. Two factors of vulnerability undermine the PLA's C2 structure. First, the narrow or individual service interests of the PLA's fighting arms denude effective coordination and cooperation in joint operations.⁴⁶ The second constraint and vulnerability is the primacy of ground-based officers assigned to critical command billets,⁴⁷ who could potentially constrain effective coordination and synchronisation in joint operations. Compounding these woes is the absence of Joint Command and Personnel and the necessary means for the training, planning, and execution of combined arms warfare.⁴⁸ These deficiencies were addressed by Xi Jinping in what can be said to be one of the greatest overhauls to the PLA force organisation. This reorganisation of the PLA into five theatre commands, each with its own political commissar is one of the methods the CPC is overtly reasserting its control over the PLA. This ensures no decision-making process occurs without a party member present, in line with Xi Jinping's need to ensure the PLA remains loyal to the party and no action it takes is to the detriment of the latter. While this reorganisation streamlines the command structure of the PLA, the CPC has also addressed the problem of jointness in operations through the appointment of naval officers to command the theatres of the mainland. While currently the only naval commander in the newly organised PLA is Vice Admiral Yuan Yubai⁴⁹ (who is commander of the Southern Theatre), this signals an increasing effort from the CMC to ensure that

jointness in command and operations is achieved. It is clear that the CMC is ensuring the PLA incorporates a joint command structure to better integrate the different services within the PLA into a single operational fighting force. These improvements can spell danger to the Central Asian Republics, which border China and strengthen Beijing's power projection capabilities into the Indian Ocean Region (IOR).⁵⁰

A second Indian perspective assesses that China's military modernisation dovetails Beijing's increasingly assertive foreign policy, a pattern that has been evident since 2008.⁵¹ The PLA is gearing its forces for new military missions and goals. Modernisation also serves the purpose of safeguarding Chinese interests and protecting Chinese expatriates living and working in countries that are part of the Belt and Road Initiative (BRI).⁵² Stretching from the Eurasian region to the Western Pacific, China, through military exchange programmes are increasing interoperability with the BRI countries, which field Chinese weapons systems.⁵³ China has modernised its forces to win informationised local wars. For this brand of warfare, the PLA emphasises network centricity of all weapons systems at sea, air and land connected in real time for the effective use of its weapons to service mission objectives and the protection of military assets.⁵⁴

The thrust of the PLA's modernisation is on non-contact wars that rely on psychological operations that compel the enemy into submission without an *actual* military engagement. This is reinforced by the PLA's development of a strong navy, air force, army and the prosecution of special warfare

operations at far seas.⁵⁵ There is evidence to suggest that the PLA is deliberating the creation of a strategic support force to sustain out-of-area operations and missions. Joint command at the highest combat level is mandatory for the PLA.⁵⁶ A corollary to this assessment of the PLA's order of battle is the separation between its conventional and nuclear chain of command. Of particular relevance to India is the PLA's establishment of the Tibetan Military Command (TMC).⁵⁷ Beijing also seeks to engage in non-contact conflict which places a high premium on political and psychological dimensions of warfare.⁵⁸ Fighting a war without coming into close contact with the enemy is thus one of the major aspects of the PLA through the introduction of advanced technologies such as ASAT weaponry⁵⁹ to target space assets and the institution of the Strategic Support Forces to conduct operations in non-traditional domains such as space and cyberspace⁶⁰ to provide the PLA with the necessary force multipliers to wage any type of non-contact warfare.

A third Indian perspective is generally consistent with the first two, since the PRC's Central Military Commission (CMC) reforms that there will be a flattening of the higher military command to the extent it will be more streamlined with potentially considerable delegatory power to lower echelon commanders in the PLA's newly instituted combat zones.⁶¹ This is consistent with recent non-Indian assessments as well as internal Chinese reports that there is an ongoing effort at improving the PLA command performance in joint operations through training courses.⁶² This implies that proficiency in C2 operations is still a work in progress. It is a critical

requirement and remains a benchmark of the PLA to emulate the successful American conduct of joint operations in the 1991 Persian Gulf War.

Yet this perspective on the ultimate goals of Chinese foreign policy diverges with the preceding two. The thrust of Chinese foreign policy will be on increasing its political influence,⁶³ presumably also with those with whom it has disputatious relations such as India and the other states around the Chinese rim land. In contrast to the second perspective, China is progressively moving away from informationised war to a war driven by Artificial Intelligence (AI).⁶⁴ To sustain the latter, China has been making ceaseless efforts to develop AI that it aims to surpass that of the US.⁶⁵ It is possible that China is planning and pursuing a combination of both informationised, and AI-based wars for the successful prosecution and conduct of C2 operations.

All of this brings into question the need for the rapid restructuring of the PLA as a whole. Seeing the evolution of the PLA doctrine and of China as a whole, moving from Deng Xiaoping's doctrine of "hide your strength, bide your time" to the more current form, where Xi Jinping's determination to make China the centre of world trade has put a lot of pressure on the CPC to ensure they do not appear to be a nation with a weak military. To that end, as part of Xi's reforms, each of the theatre commands have both a military official and a commissar of the CPC within their command structures. The institution of commissars in the PLA theatre commands showcases Xi's need to project the PLA as the military wing of the CPC, leaving no questions as to where their loyalties lie. Additionally, projects such as the Belt and Road

Initiative, already seeing massive amounts of infrastructure construction, also pose the problem of security. This, coupled with Xi's ideal of having a military which can fight and win,⁶⁶ coupled with the uncertain nature of international systems and the consequences which can arise from this and the personal fear of the legitimacy of the CPC being put into question has led to him asserting greater control over the CMC and the CPC, while at the same time ensuring the uncertainties around the globe do not hamper the progress of China in any way.

It can thus be said that Xi does not want to leave anything to chance when it comes to securing his grip over the party and the military, ensuring these elements will serve his larger and more ambitious goal of making China an economic powerhouse.


CONCLUSION

Since the assumption of Xi to the position of General Secretary, the PLA has shifted towards being a more qualitative force capable of fighting any battle on any kind of terrain at a moment's notice. To ensure this is a reality, the PLA has undergone significant changes in its structuring and technological developments to make the PLA into a leaner and more efficient fighting force. However, while the PLA has undergone significant changes, no other branch can be said to be more significantly upgraded than the PLA Navy. The once neglected PLAN is now on track to becoming the dominant naval power in the near and far seas of China. Indigenous production has been one of the cornerstones of the PLA's modernisation drive, and nothing else drives this point home other than the first

indigenously produced aircraft carrier of the PLAN.

The PLA Air Force and the Rocket Forces have also seen technology play a major role in its development through the introduction of drones and UAVs and research into the integration of artificial intelligence in its next-generation aircraft and weaponry. Their emphasis on quality has also led to them focusing more on the delivery of their warheads, rather than the warheads themselves.

The modernisation drives discussed in this brief help underscore an important point in

the machinery of the CPC since Xi became general secretary. Xi has come out as another version of Mao Zedong, with some of the same aspirations and fears as his predecessors. However, Xi's ambitions of making China the centre of the modern economic world have led him to make these serious changes to ensure that his vision will have the security of a modernised and battle-ready PLA, capable of taking the fight to the enemy if need be. Through this modernisation, Xi also hopes to show the rest of the world that China is a force to be reckoned with and it is a country that has learnt from its past failures and is today stronger than it has been in many years. 

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