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# 'Beyond Hardware and Technology': The Intangibles of China's Naval Power (Part 3)

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*This is part three of a three-part series on China's naval power*

**(PART 3: TACTICAL LEVEL)**

As introduced in the Part 1, so far, most analysis of China's naval power worldwide has focused on the PLA Navy's existing and projected force-levels, and their associated hardware inductions and technological progression, with little emphasis on the 'intangibles' of China's naval power. These intangibles include strategic intent, objectives and strategy; tradition, operational experience and joint-service synergy; and the trends with regard to training and exercises, maintenance philosophy, and so on.

Parts 1 and 2 assessed China's naval doctrine at the 'military-strategic' and 'operational' levels; Part 3 undertakes an assessment of the intangible elements of China's naval power at the 'tactical' level, including the quality, disposition and employment of the 'man behind the machine.'

## Human Resource

### *Shortage of Educated Personnel*

Authoritative literature indicates that the PLA Navy has been beset by a major shortage of educated personnel. Alike the rest of PLA, a major proportion of the PLA Navy's enlisted ranks constitutes rural intake requiring lower educational standard (middle school). Cognisant of better employment opportunities in cities, the proportion of urban intake has remained low (urban candidates tend to have higher academic standards). Although the officers usually come from urban areas, they also do not held a very high educational standard since they were either graduates of PLA military academies or have been directly

promoted from the ranks without receiving a higher education. The urban-rural divide can lead to officer-enlisted tension in the PLA Navy.

A personal interaction between the author and Chinese think-tanks indicates that the challenge of recruiting educated youth is more acute in case of the PLA Navy's submarine arm. Although China has traditionally emphasised on its submarine capability, its tough demands on personnel without adequate commensurate dividends for them has led to the progressively weaning volunteering for the submarine cadre. At least until a few years ago, many *Romeo*-class submarines were placed in reserve due to non-availability of trained crews.

### *Sub-Optimal Employment of Officers*

The same RAND report also indicates that until a decade ago that the PLA Navy officers were sub-optimally employed in operational billets. The officers were tasked to undertake many duties on board warships that are usually performed by non-commissioned officers (NCO) in other navies. The PLA created the NCO cadre only in 1999. Even at present, PLA Navy's officer cadre constitutes about one-third of its total personnel strength, whereas the average ratio worldwide is about 15 per cent. This means that the officers are not groomed for their primary role relating to command and control functions of a warship. This is among the key reasons why the internal command structure on Chinese warships depends excessively on the Captain and the heads of departments (HOD). There is little if any delegation of authority and responsibility to the other officers, which leads to the degradation of the ships effectiveness as these 'command nodes' become weary with time. This becomes a particularly serious issue during extended warship deployments.

The PLA is continuing to increase the NCO cadre. NCOs presently constitute about half of the PLA's enlisted force, but 95 per cent of them are from the enlisted ranks, and thus not graduates of universities or three-year technical colleges. They are being given the required education progressively whilst being in service.

## Training and Exercises

Reports indicate that historically, training and exercises have been a weak area for the PLA Navy, due to both a shortage of trained manpower and 'shallow' level of proficiency attained. Until 1996, China's military training was considered very poor. Exercises were largely 'scripted', with predetermined outcomes, and very limited hitherto due to limited operational availability of assets. In 2002, the PLA Navy issued an *Outline of Military*

*Training and Evaluation* (OMTE), which articulated the need for more realism in training and exercises. In China's 2004 Defense White Paper, this aspect was reiterated, indicating a realisation of this 'weak link' and the need to address it. These instructions, however, have not always had the desired effect. For instance, in accordance with the OMTE, the PLA Navy Air Force upgraded its pilot training regime adding more rigour to the training under hostile conditions. However, while increasing the sortie-duration, it was compelled to reduce the number of training sorties so as not to increase the total number of flying hours. This was perhaps necessary to ease the load on aircraft engines to avoid their frequent overhaul/ replacement, but it amounts to a major compromise between achieving proficiency in handling a tactical opposition and the more critical take-off and landing procedures and the accompanying readiness-checks, which feed into not only flight safety, but also combat preparedness.

Since a decade ago, doctrinal emphasis has begun to focus more on the PLA Navy's training and exercises with the other PLA services. In June 2006, the PLA released new guidance to increase realism in training and exercises, including through joint-service evolutions. However, at that time, the term "joint" simply referred to forces from more than one service operating in the same area at the same time. In more recent years, the PLA Navy has been observed to be operating more frequently in coordination with the other services, and increasingly further from China's shores. The Chinese media has also been increasingly reporting these exercises/ operations, such as the following:

- PLA Air Force aircraft simulating attacks on PLA Navy warships.

- PLA Army attack helicopters providing air cover to PLA Navy ships engaged in amphibious exercises.

- The April 2014 PLA Navy and PLA Air Force joint search for Malaysia Airlines MH370 in the southern Indian Ocean.

Rather than true joint operations, however, these may be better framed as 'opposing-force training' or merely 'joint-service coordination' at the tactical level. The PLA still lacks true 'integration/ jointness', which should emanate from joint-planning at the operational level, leading *inter alia* to a joint command and control at the tactical level. The operational-level integration in PLA has begun only recently in December 2015 with the permanent 'Theatre Command Concept' (as examined in Part 2 of this paper). Notably, until lately, the PLA has not even conducted any joint theatre-level exercise involving all PLA defence

services. Therefore, it could be assumed that the 'Theatre Command Concept' would take considerable time to translate into 'joint-ness' at the tactical level.

## Tactical Doctrines

The PLA Navy succeeded in instituting an organisation for development of naval concepts and doctrines well over three decades ago. The Navy Military Studies Research Institute – commonly referred to as the Navy Research Institute (NRI) has been the cornerstone of the organisation since 1985. The 'Tactics Department' of the NRI is tasked for development of doctrines at the tactical level. A US intelligence report of 2007 indicates that the doctrine-development process in the PLA Navy is fairly well developed, and very similar to that of most advanced navies. However, a realistic assessment of tactical practices indicates that the PLA Navy's tactical doctrines remain underdeveloped and archaic. This is largely attributable to the fact that the PLA remains a conservative organisation with inherent internal resistance to implement transformational doctrinal reforms. This has led to a mismatch between the ostensible sophistication of the PLA Navy's hardware and its tactical utilisation. The following text provides an illustrative (rather than an exhaustive) account of the PLA Navy's doctrinal voids at the tactical level.

### *Anti-Shipping Task*

The 'anti-shipping' task constitutes one of the key enablers of the sea-denial doctrine. Ever since China followed the strategic-level naval doctrine of 'static coastal defense' (until the 1980s, as mentioned in Part 1 of this paper), the PLA Navy has been proficient in operating anti-ship missiles and torpedoes from their numerous low-cost combatants. The doctrinal emphasis on anti-shipping has continued to this day. China's technological 'head-start' in anti-shipping capability has ensured that the PLA Navy's meets the stringent demands of the contemporary maritime battlefield, such as in terms of the sophistication of the weapon system, the survivability of the weapon *per se*, and its ability to be launched from a variety of platforms. The imperative for maintaining a 'top-notch' anti-shipping capability – in terms of land, ship, aircraft and submarine launched missile systems - is reinforced further by China's current operational doctrine of Anti-Access/Area Denial (A2/AD).

Another imperative applicable to contemporary surface missile warfare is the need for coordination among dispersed forces for greater strike effectiveness. The PLA Navy has not yet demonstrated the ability to coordinate missile strikes among dispersed units, which is a tactical imperative to extend sensor ranges (for optimum utilization of the high weapon ranges), maintaining the launch platform's radar silence and saturating the adversary's

missile defenses. This inadequacy is linked to China's C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) capabilities. Although the PLA Navy has been able to develop the C4 systems to contemporary standards, the 'SIR' component has traditionally lagged behind the C4 component. It should be noted, however, that this is more of a technological void, rather than a doctrinal one.

## *Anti-Air Task*

Since 'sea-denial' has traditionally been the mainstay of China's naval doctrine at the military-strategic level, China accorded a preferential treatment to developing anti-shipping tactics. Since China did not encounter any significant maritime-air threats, the PLA Navy's emphasis of 'anti-shipping' was at the cost of its doctrinal attention to the 'anti-air' dimension. In the 1960s and 1970s, as part of China's coastal defence doctrine, the PLA Navy warships began to be provided air cover by its own land-based fighters (PLA Navy Air Force). Such land-based fighter air-defence was considered adequate. Since the PLA Navy units have rarely been deployed as a composite task force(examined later), fleet air-defence has been a major doctrinal deficiency, and thus a capability void. This translates into PLA Navy's key vulnerability today, particularly considering the increased tonnage and value of its major warships, including large amphibious ships and the aircraft carrier.

Over the past decade, the PLA Navy has re-oriented its doctrinal orientation with increased emphasis to fleet air-defence. It has translated into all new-construction warships being equipped with advanced gun and short-range missile systems for 'terminal (point) air-defence' of individual platforms. However, the most crucial component of the fleet layered Anti-Missile Defence (AMD) to forestall the adversary saturating own missile defences is 'area air-defence', which remain relatively weak. Only a few of the PLA Navy's latest Type 052 destroyers are armed with medium and long-range surface-to-air missile (SAM) systems with engagement ranges of more than 25 km; and most of these are either imported or reverse-engineered. Furthermore, their effectiveness against modern sea-skimmers with advanced CECUM (Electronic Counter Counter Measure) features is not yet proven.

Ostensibly, China's realization of its gaping doctrinal void in fleet air-defence is among the key drivers for its decision to opt for the aircraft carrier. Theoretically, a carrier-based organic aviation could contribute significantly to interdict the adversary's missile platforms before the missile launch is achieved from stand-off ranges. However, as noted in Part 1 of this paper, this would lead to a carrier-based sea-control doctrine, which is unsuited for China's maritime geography. China could have better augmented its fleet air defence by

employing land-based fighters, and extending their operating ranges through mid-air refuellers, if required.

## *Anti-Submarine Task*

Anti-Submarine Warfare (ASW) has always been the Achilles' Heel of the PLA Navy. The lack of doctrinal emphasis is similar to the anti-air doctrine, viz. China's near-perennial focus on anti-shipping task and the absence of submarine threats during the formative years of its navy. For the PLA Navy, the operational need for sanitizing the sub-surface domain never arose.

This translated into lack of the PLA Navy's ASW capacity in terms of technology, largely in terms of sonar technology, anti-submarine weapons and anti-submarine helicopters. While China's focus was directed at developing naval capabilities like submarines, strike aircraft, anti-ship missiles, torpedoes and sea-mines, it came at a cost of investing in SONAR (Sound Navigation and Ranging) technology. China has never been able to develop the technological capacity to build advanced sonars like towed arrays indigenously and has always resorted to foreign acquisitions. Even when towed-arrays were inducted in the PLA Navy, these were fitted on submarines rather than surface combatants, due to the predominance of the former in the naval doctrine. China's defence industry did develop a formidable array of torpedoes, but these were essentially for anti-shipping role. The void of ASW aircraft relate to both integral and shore-based aircraft, and to lack of air-sub (aircraft-submarine) cooperation, which is an important requisite for effective ASW. The PLA Navy's first generation ships had no integral helicopters, whose dipping sonars could have been valuable for ASW. Although the later ships do have integral aviation in the form of domestically developed helicopters, these have restrictions of all-up-weight, leading to constraints in deploying dipping sonars.

It is also important to consider that the discipline of underwater warfare, known to be as much an 'art' as it is a 'science', depends much on training and experience of operators, which heretofore has been a constraint in for the PLA Navy.

## *Submarine Operations*

The PLA Navy has taken its traditional doctrinal emphasis and strength in operating submarines further to conform to the strategic and operational-level doctrines (of 'strategic depth' and A2/AD respectively, This has translated into current level of force-levels of various submarine types and their relative sophistication. Based on the OMTE issued in 2002, the PLA Navy is developing and implementing new and more realistic tactics and combat methods to enable its submarines to be able to attack, survive after an attack, and maintain the capability to attack again at a later time. This is a change from the tactics followed by the PLA Navy in yesteryears, which focused primarily on attacking and less on defence before and after an attack, thereby reflecting a 'people's war' characteristic. The incorporation of towed arrays on PLA Navy submarines indicates the intent to operate the submarines in deeper waters. (A towed array would be unsuitable for shallow waters since it would drag along the sea-bottom). In the coming years, therefore, the PLA Navy may increasingly deploy its conventional submarines in the waters of the Western Pacific beyond the China seas, and its nuclear attack submarines (SSN) in the Indian Ocean.

However, some prevailing practices of the Chinese submarine operations indicate very outdated tactical concepts. For instance, the PLA Navy has been exercising multiple submarines attacking an adversary's surface task force. This indicates a very outdated tactical concept of a time when surface forces were devoid of air-ASW. Today, a collective formation of PLA Navy submarines would be highly vulnerable to the ASW helicopters integral to an adversary's surface task force, and may not be able to cause any harm to the task force.

It may, however, be noted that the latest Chinese submarines today are armed with underwater launched anti-ship missiles. For targeting, the group of Chinese submarines would need data on the surface target's motion parameters. To maintain their stealth, these submarines cannot employ their integral sensors to obtain the data, and would thus need 'external' inputs through its trailing wire antenna (TWA) closer to the sea surface. This would pose a major risk in vicinity of the adversary's surface task force. However, theoretically, the inputs on the task force could be achieved as far as the maximum effective missile range of 100 km plus. If so, a combined (even if not coordinated) missile attack on the surface task force could saturate its defences and lead to much harm.

## *Composite Task Force Operations*

Based on the new OMTE of 2002, the PLA Navy's surface forces are moving away from task forces composed of a single class of vessel to employing 'composite task forces', alike the other major navies. Meeting and synergising the diverse functional demands and operating parameters of the forces comprising the 'composite' presents a major challenge for the PLA Navy. Among the challenges is Underway Replenishment (UNREP), an ability that the PLA Navy has acquired only recently since its 2008 anti-piracy deployment in the Gulf of Aden. Notably, in the first few missions, the replenishment was observed to be done in the most rudimentary manner, in a stopped condition, with the receiving warship tied to the logistic ship.

This indicates that the PLA Navy is at the nascent phase of evolution with regard to the high level of tactical coordination necessary for operating composite task forces. The PLA Navy may, therefore, take substantial time before it can field an effective Carrier Task Force (CTF) with integral aviation and SSN escorts.

## *Overall Deduction*

In the light of the above, one could observe a divide between the sophistication of PLAN's hardware and its tactical utilisation. This reason of this doctrine 'lag' may be attributable to three factors:

- **'Static Inertia' of Party Functioning**. The conservative nature of the PLA to adapt to new institutional, systemic or operational changes, possibly aggravated by the need for political assent to any doctrinal change, even at the tactical level.

- **Lack of 'Exposure' to Doctrines of Major Naval Powers.** China's traditional national policy of opaqueness in defence matters has restricted the PLA Navy's interactions with foreign navies, and thus stunted its doctrine-development through learning best-practices of major naval powers. Though the PLA Navy has lately conducted combined exercises with navies of France, Britain, Australia, Pakistan and India, as well as being part of the Rim of the Pacific Exercise (RIMPAC), these exercises have been pitched at very basic level. The exercises with the Russian Navy since 2005 have been fairly advanced, but this can provide limited doctrinal value. Notably, the PLA Navy has never conducted submarine and ASW exercises with foreign navies, the former to maintain secrecy and stealth of its submarines, and the latter to hide its 'weakness' in ASW.

- **Lack of Battle Indoctrination**. Although the PLA Navy is increasingly incorporating realism in its training and exercises, these efforts may not be able to completely offset its

lack of battle indoctrination. Chinese naval forces have never been engaged in a conventional war, only localised maritime skirmishes such as with Vietnam and the Philippines. Even in its land wars – for instance, against Vietnam in 1979 – China did not achieve any notable edge – either technologically, or in doctrinal terms - to build upon.

## Hardware Maintenance

A navy's hardware maintenance and upkeep philosophy represents the 'life-blood' of its hardware capabilities. There are several indicators that at least until the early-2000s, the PLA Navy encountered major problems with regard to the exploitation of its onboard equipment, machinery and weapon systems. Notably, even though the PLA Navy has been operating submarines since 1957, this void has been most conspicuous in its submarine forces. It is well known that the underwater domain is the most unforgiving to errors made by the submarine crew, but lapses are known to have occurred by the higher naval hierarchy as well. When, for instance, the PLA Navy inducted the Russian Kilo-class submarines in the late-1990s, it 'cut corners' to save money for training of the commissioning crew in Russia. This was reported as among the key reasons why the first two boats were not operational for two years after the induction. Later, in 2003, the loss of Ming 361 submarine was a reflection on the unsatisfactory maintenance, and the technical training organization itself. It led to indictment of the entire chain of command ranging from the PLA Navy Commander (Admiral Shi Yunsheng) to the Senior Captain closely associated with the maintenance.

Another problem for the PLA Navy has been maintaining the imported hardware integrated with locally manufactured hardware. Of course, this challenge is not unique to the PLA Navy, and is an issue common to all navies of developing countries like India that are dependent on foreign systems, and concurrently endeavour to become self-reliant. However, China's adversity has been compounded due to its emphasis on 'reverse engineering' the imported hardware to build these systems domestically. Much of such 'copied' hardware was known to have no authentic documentation like 'technical description' and 'operating instructions', which has been posing major problems for both maintainers and operators in the PLA Navy.

The problems of maintenance in the PLA Navy become more complex during extended stand-alone deployments of its platforms, especially in distant areas, which – as mentioned in Part 2 of this paper - was not conceived until the Gulf of Aden anti-piracy mission beginning December 2008. Until 2002 (and possibly, even later), the warships deployed for extended missions were assigned additional spare-parts packages and specially

trained technicians for routine maintenance. Interestingly, two Senior Captains of the PLA Navy embarked onboard US warships during the 1998 RIMPAC exercises in Hawaiian waters emphasized how impressed they were by the fact that the American sailors continued performing equipment maintenance while the ship was underway, which indicates that this was not the practice in the PLA Navy.

It is not clear whether today - after more than a decade - the PLA Navy has ironed out its hardware maintenance issues. Likely, some of the deficiencies have been overcome. However, the underlying reasons for these seem to have been more doctrinal - skewed maintenance philosophies – rather than the lack of adequate means. Given the PLA Navy's constraints to induct quality human resource (as mentioned earlier), any significant upgradation of hardware maintenance standards is likely to pose challenges.

## Conclusion

Over the past two decades, the PLA Navy's strategic imperatives have been pushing not only the development of its 'means' ('tangible' hardware capabilities), but also the 'ways' component ('intangibles', primarily doctrines) in its strategy formulation. This flows from the PLA Navy's compulsion to 'adapt' to the emerging security environment, besides furthering the national objective of attaining 'big power' status in global geopolitics. While such a 'transformative' doctrinal reorientation may be valid and justifiable, the key question is whether the PLA Navy will be able to cope with the oxymoron of 'doctrinal transformation'. At present, it is evident that China's naval doctrine at the strategic level is not self-evolved, and thus cannot be considered as 'mature'. Under these circumstances, despite the PLA Navy's overbearing commitments in the Western Pacific rim and the major doctrinal deficiencies to counter military threats therein, the force is gearing itself for distant maritime power-projection. This represents a paradox, since it does not conform to a conventional maritime strategy, at least in the thinking of the other major naval powers of the world. Perhaps, the Chinese are thinking differently.

The PLA's operational art is adapting well from its traditional land-based focus to a fighting a maritime war. However, its reorientation is still at a nascent stage. Additionally, the functional integration among the PLA services continues to develop. Hence, one may expect that it would take a few decades before the PLA Navy would be able to effectively contribute to a maritime war in any theatre of the Western Pacific rim. The PLA Navy's increasing emphasis on stand-alone distant operations, and the attendant imperatives of maritime logistics may further dilute its attention to integrated operations in China's maritime periphery.

At the tactical level, the PLA Navy could employ asymmetric means in its concept of sea-denial. The continued prevalence of its erstwhile doctrine of employing packs of submarines could be useful in this regard. However, its continued doctrinal voids at the tactical level clearly indicates that the force has not been able to effectively translate the strategic-level doctrine of 'strategic depth' articulated by China long ago in the 1980s (as noted in Part 1 of this paper) into tactical doctrines, particularly with regard to the PLA Navy's surface-based operations. At least not yet.

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