

Modernising China's Military, 1997-2012

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ABSTRACT: The Chinese People's Liberation Army (PLA) has since the late 1990s been engaged in an ambitious, concerted, and methodical transformation. As a result, the PLA has noticeably improved its capabilities in several specific areas – particularly missile attack, precision-strike, power projection at sea and in the air, and joint operations. In particular, it has made significant advances in exploiting “informatisation” when it comes to developing advanced weaponry, accelerating the pace of military modernisation, and creating new levers of military power for the PLA. While Chinese military power may still pale in comparison to the US armed forces, the strength of the PLA relative to its likely local competitors in the Asia-Pacific region, such as Taiwan and Japan, has grown significantly, and will likely continue to grow over the next ten to 20 years. As a result, China is definitely gaining an edge over other regional militaries in the Asia-Pacific region.

KEYWORDS: China, People's Liberation Army (PLA), military modernisation, informatisation, defence spending, defence industries, asymmetric warfare, military professionalism, arms races, joint operations

For the past 15 years, China has been engaged in a concerted effort to modernise and upgrade its armed forces. These modernisation activities have several objectives. For one thing, as China strives to become a global power, it is increasingly seeking “hard” power, i.e., military strength, commensurate with its growing economic, diplomatic, and cultural “soft” power. Second, Beijing appears to be more prone to use military force (or the threat of military force) to defend and promote its regional interests, such as its territorial claims in the South China Sea or protecting local sea lanes of communication (SLOCs) vital to its energy supplies and trade; consequently, building up that military wherewithal is instrumental to this strategy. Third, it aspires to increase its military capacities in order to keep the pressure on Taiwan *not* to declare independence *and* to eventually accept some kind of reunification with the mainland; at the same time, China wants to reduce the willingness of the United States to intervene on behalf of Taiwan in case of a cross-Strait military clash by raising the costs of involvement for the US. Fourth, China wants to increase its capacities for military operations other than war (MOOTW) so as to defend its growing interests around the world, to which end it is participating more in activities such as peacekeeping operations, humanitarian assistance and disaster relief operations, and anti-piracy operations. Finally, China overall seeks military power to mitigate the rising American military presence in the Asia-Pacific, and to establish itself as a credible rival to the United States in this region.

These efforts have paid remarkable dividends, and since the late 1990s the People's Liberation Army (PLA) has made substantial progress in transforming itself into a modern fighting force; in many areas, it is practically unrecognisable compared to the PLA that existed before 1997. The impact of this transformation has been particularly noticeable in the past few

years in the form of a much more assertive, even aggressive, China, increasingly willing to use its military to protect and advance its national interests. Prominent examples of this increased use of the PLA as an instrument of national policy include the dispatch of PLA Navy vessels to fight piracy in the Gulf of Aden, and the PLAN's recent launching of an aircraft carrier. What the end result of this military modernisation process will be, or how China may further use its growing military power, is still an open question.

1997 is a good place to start when addressing the current modernisation of the PLA, as this was a watershed year in the history of the Chinese military. Starting that year, for instance, Chinese defence spending began its remarkable (and, except for one year, unbroken) run of double-digit real annual growth (after adjusting for inflation), which underwrote the process of military modernisation that was to follow. Also in 1997, the decision was made by the central government to force the PLA to divest itself of the bulk of its commercial activities so as to concentrate on its primary functions – deterrence, compellence, and if necessary, war-fighting.⁽¹⁾ At the 15th Party congress in September 1997, the Chinese Communist Party (CCP) decided to radically reform the state-owned enterprise (SOE) sector, which marked the beginning of the current process of restructuring and upgrading the Chinese defence industry. Finally, 1997 was also around the

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1. James Mulvenon, *Soldiers of Fortune*, Armonk (NY), M.E. Sharpe, 2001, p. 177.

time the PLA officially adopted the strategic concept of fighting “limited local wars under high-technology conditions” (and later, “under conditions of informatisation,” or the addition of computers and information-sharing networks to military platforms), which still drives current operational and hardware requirements for military modernisation.

This article traces the process of Chinese military modernisation over the past 15 years (1997-2012), focusing on its drivers and enablers, the recapitalisation of the armed forces with more advanced military hardware, and changes in PLA training, recruitment, and retention. It then assesses the progress that the PLA has made over this period in transforming itself into a more modern military force, where it still faces challenges, and how, in the end, a more powerful PLA may impact the regional military balance.

Tying military modernisation to requirements: Chinese defence strategy in the twenty-first century

China’s defence strategy is largely laid out in its National Military Strategic Guidelines, a set of overall principles for planning and managing the development and use of the PLA. According to the Annual Report to Congress on Military Power of the People’s Republic of China by the US Department of Defense (DoD), the critical “operational component” and “highest-level strategic guidance for all PLA activities” is “active defence” (*jiji fangyu* 积极防御). The key elements of the PLA’s active defence doctrine are (1) a defensive military strategy (permitting attacks only after having first been attacked, although what constitutes an attack is left purposely vague, and could include pre-emptive or even preventive strikes), with the goal of defending CCP rule, national sovereignty, and territorial integrity; (2) a “forward defence” posture; and (3) an operational doctrine that focuses on the opposing force’s weaknesses, initiated only when “time and conditions... favor [PLA] forces, and which does not limit the counter-offensive in terms of time, space, or response.”⁽²⁾

At the same time, the goal of China’s defence program is to build a force capable of fighting and winning “limited local wars under conditions of ‘informatisation.’”⁽³⁾ In such an environment, war-fighting will likely revolve around short-duration, high-intensity conflicts characterised by agility, speed, and long-range attack, employing joint operations fought simultaneously throughout the entire air, land, sea, space, and electromagnetic battle space (i.e., five-dimensional warfare), and relying heavily upon extremely lethal high-technology weapons. Such an operational doctrine also emphasises pre-emption, surprise, and “shock value,” given that the earliest stages of conflict may be crucial to the outcome of a war. Consequently, modern Chinese defence requirements stress mobility, flexibility, power projection, precision-strike, and joint operations fought throughout the entire battle space.

In particular, “informatisation” (*xinxihua* 信息化) means that information technologies (IT), especially those capabilities relating to command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), are considered paramount to expanding military effectiveness. This entails, among other things, dominating the electromagnetic spectrum through “integrated network electronic warfare” as well as exploiting technological advances in microelectronics, sensors, propulsion, stealth, and special materials to outfit the PLA with precision-strike weapons, including ballistic and anti-ship or land-attack cruise missiles. In short, the PLA, in its long transition from “People’s War” to “limited local

wars under conditions of informatisation,” is seeking to move from being a platform-centric to a more network-centric force, or one where the crucial characteristic of the force is the network linkages among platforms as opposed to the platforms themselves.⁽⁴⁾

Improvements in the PLA’s capability to conduct “high-intensity, regional military operations” have increasingly enabled the Chinese armed forces to pose what US military analysts refer to as an “anti-access/area-denial” (A2/AD) threat. The PLA’s capacity for A2/AD is intended to threaten a potential enemy’s ability to enter or operate freely in a war zone. “Anti-access” is typically described as attacks on air or naval bases using ballistic and cruise missiles, fighter-bombers, and special operations forces, while “area denial” operations are efforts to deny outside (in this case, US) forces the ability to enter into the Western Pacific by targeting the air and maritime dimensions using anti-ship missiles and submarines. A2/AD is seen as especially crucial in deterring or countering third-party interventions, particularly efforts on the part of the US military to come to the aid of Taiwan in the case of a cross-Strait crisis.⁽⁵⁾

At the same time, the PLA is in the midst of a shift from simpler types of joint operations (JO) to more advanced and complicated integrated joint operations (IJO). For the PLA, joint operations usually meant having at least two different services arriving at the same location at roughly the same time, usually with one service supporting another; in such a situation, there was relatively little fusion when it came to things like command and control.⁽⁶⁾ Ultimately, however, the PLA is looking to transition beyond joint operations to full-on integrated joint operations. IJO, aided by the promise of informatisation, would enable the PLA to engage in flexible, deployable, mobile, and multiservice military operations, perhaps even including non-PLA forces such as paramilitary organisations and local police forces. IJO will require the PLA to master a new type of command and control system entailing seamless information-sharing, multilevel synchronisation in the decision-making process, and real-time response.⁽⁷⁾ To date, these capabilities are still aspirational, yet they are driving the overall direction towards which modernisation is oriented.

Enabler of Chinese military modernisation #1: Rising defence spending

The considerable modernisation of PLA capabilities has been underwritten by the tremendous and sustained growth in Chinese military expenditures over the past decade and a half. China has experienced double-digit real growth in defence spending nearly every year since the late 1990s. Even according to its own official national statistics, which most expert observers believe substantially understate spending levels, China’s defence budget from 1999 to 2008 expanded at a rate of 16.2 percent *per annum*.⁽⁸⁾ Most recently, in March 2011, Beijing announced that it would

2. Office of the Secretary of Defense (OSD), *2011 Report to Congress: Military and Security Developments Involving the People’s Republic of China*, Washington, US Department of Defense, August 2011, p. 22.
3. “Chapter III: Revolution in Military Affairs with Chinese Characteristics,” *China’s National Defense in 2004*, Beijing, State Council Information Office, 27 December 2004; OSD, *2011 Report to Congress*, p. 22.
4. You Ji, “China’s Emerging National Defense Strategy,” *China Brief*, 24 November 2004.
5. OSD, *2011 Report to Congress*, p. 2.
6. Srikanth Kondapalli, “The PLA’s Joint Operations: Perception and Development,” paper prepared for *Conference on Chinese Warfighting*, Taipei, 10-11 November 2009, p. 4.
7. OSD, *2011 Report to Congress*, *op. cit.*, p. 22.

allocate 601 billion RMB, or US\$91.5 billion for defence, an increase of 12.7 percent over 2010. Indeed, the 2010 defence budget of RMB532.1 billion (US\$81 billion) was itself 7.5 percent greater than 2009's RMB481 billion (US\$70.3 billion) defence budget, which was in turn 14.9 percent larger than the 2008 defence budget. Overall, since 1997, Chinese military expenditures have increased at least 600 percent in real terms. As a result, since the late 1990s, China has moved from having a military budget smaller than Taiwan's to being the second-largest defence spender in the world, outstripping Japan, France, Russia, and the United Kingdom. Today, only the United States spends more than China on defence.

Its dramatically expanded commitment to funding defence expenditures has allowed China to devote considerable resources to procurement and defence industrial research and development (R&D). While all categories of Chinese military spending, including personnel, training, and operations, have increased significantly over the past 15 years, nowhere has Beijing's munificence been more notable, or more alarming to its neighbours, than in the PLA's budget for equipment acquisitions. According to its biannual defence white papers, Beijing has consistently allocated approximately one-third of its military expenditures over the past decade and a half to equipment purchases. This compares very favourably with most other countries. France, for example, apportioned 27 percent of its 2009 defence budget to equipment and R&D, while the United Kingdom dedicated 26 percent, and Germany only 17 percent.⁽⁹⁾ In 2010, only 17.5 percent of all Japanese defence-related expenditures went to buying equipment, along with only 2.5 percent for defence R&D.⁽¹⁰⁾ In real terms, PLA annual spending on equipment procurement has increased from around US\$3.1 billion in 1997 to an estimated US\$30.5 billion in 2011; of this, perhaps US\$4 to 6 billion is dedicated to defence R&D. This likely makes China the second highest spender in the world in terms of spending on procurement, and at least the third highest when it comes to defence R&D.⁽¹¹⁾

If anything has supported China's recent expansion in military power, it is this explosion in defence spending, which has permitted the PLA to acquire new surface combatants and submarines, modern fighter jets, air-to-air refuelling aircraft, satellites, unmanned aerial vehicles, and a host of ballistic, cruise, and tactical missile systems. Additionally, expanding defence budgets have allowed China to fund an array of new military R&D projects, such as its J-20 fifth-generation fighter, its DF-21D anti-ship ballistic missile (ASBM), and its nuclear submarine program.

As noted above, most expert observers believe that the official budget released by the Chinese every year accounts for only a fraction of actual defence spending. In particular, whole categories of military expenditure are believed to be missing from official figures, including arms imports, expenses for the People's Armed Police (PAP) and militia/reserve forces, state subsidies to China's military-industrial complex, and earnings from PLA-run businesses. How much all this extra-budgetary spending actually amounts to has been the subject of considerable debate and analysis in Western literature on the PLA, and unofficial estimates of "real" Chinese defence expenditures have ranged from anywhere between one-and-a-half to as high as ten times greater than the official budget.⁽¹²⁾ The US DoD, for example, has asserted that China's actual military expenditures are at least twice the officially stated figure (though the DoD provides no methodology or criteria for arriving at this figure).⁽¹³⁾ In fact, the actual amount of extra-budgetary spending may actually be quite small compared to the publicly announced defence budget – perhaps \$2 billion to \$4 billion. Nevertheless, even such a small amount could be significant when



Chengdu J-20.

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it comes to underwriting certain Chinese military activities, particularly internal security, which is normally the purview of the PAP.

This upward trend is likely to continue for some time. In May 2006, for example, Beijing approved a 15-year national development plan (2006-2020) for defence science and technology, with the goal of "transforming the PLA into a modernised, mechanised, IT-based force" by 2020.⁽¹⁴⁾ This program is intended to boost military R&D spending, focusing on high-technology weapons systems (and specifically on "IT solutions"), supporting advanced manufacturing technologies, and cultivating collaborative international defence R&D efforts.⁽¹⁵⁾

Enabler of Chinese military modernisation #2: Defence industrial base reforms

Since the establishment of the People's Republic, Beijing has striven to become self-reliant in the development and production of armaments, and accordingly it has created the largest military-industrial complex (MIC) in Asia. The Chinese MIC comprises more a thousand SOEs, employing at least one million workers, including several thousand scientists, engineers, and technicians. In particular, China is one of the few countries in the world to produce a full range of military equipment, from small arms to armoured vehicles to fighter aircraft to warships and submarines, in addition to nuclear weapons and ballistic missiles.

Nevertheless, despite its ambitions and scope, China's MIC has shown, for most of its history, an unimpressive record of performance. As recently as the late 1990s, China still possessed one of the most technologically backward defence industries among the major powers of the world. Most indigenously developed weapons systems were at least 15 to 20 years behind those of the West, and quality control was consistently poor. Moreover, China's defence R&D base was deficient in several critical areas, including

8. "China Plans to Boost 2009 Military Spending by 14.9%," *Bloomberg*, 4 March 2009.
9. European Defence Agency (EDA), *Defence data of EDA participating member states in 2009*, Brussels, p. 9.
10. *Defence of Japan 2009*, Tokyo, Ministry of Defence, 2009, pp. 164-166; Jon Grevatt, "Japan Proposes Defence Cut for 10th Year," *Jane's Defence Industry*, 18 December 2009.
11. In 2009, for example, France spent approximately US\$14 billion on procurement and US\$5.8 billion on defence R&D; that same year, the United Kingdom spent US\$10.9 billion and US\$4.2 billion, respectively, on procurement and R&D. EDA, *Defence Data of EDA Participating Member States in 2009*, p. 11.
12. See Richard A. Bitzinger, "Just the Facts, Ma'am: The Challenge of Analyzing Chinese Military Expenditures," *China Quarterly*, March 2003.
13. OSD, *2011 Report to Congress*, op. cit., p. 41.
14. Ben Vogel, "China Embarks on 15-Year Armed Forces Modernization Program," *Jane's Defence Weekly*, 1 July 2006.
15. Vogel, "China Embarks on 15-Year Armed Forces Modernization Program," art. cit.; OSD, *2011 Report to Congress*, op. cit., p. 45.



The J-10 fighter.

Source : Wikimedia/Retxham

aeronautics, jet propulsion, microelectronics, computers, and new materials.

Since around the turn of the century, however, China has made significant progress in turning around its long-ailing defence sector. This is evident in the growing number of new types of weapons, increasingly of a quality and capability comparable to Western systems. These include the J-10 fighter, the *Yuan*-class diesel-electric submarine, the Type-052C destroyer, and the HQ-9 long-range surface-to-air missile (akin to the US Patriot). At the same time, China appears to have produced the world's first working anti-ship ballistic missile (ASBM), and it has test-flown a purportedly fifth-generation combat aircraft. Additionally, production and sales are up throughout the Chinese MIC.

After decades of false starts and fitful progress, Beijing appears to have finally hit upon the right formula to reform and revitalise its MIC. Beginning in the late 1990s, Beijing launched several initiatives intended to inject more market-oriented incentives into the defence industrial sector, including the introduction of Western management techniques, a new emphasis on quality control, and greater oversight by the Chinese military when it comes to procurement and program management. Efforts were also made to rationalise the country's bloated military-industrial complex, laying off excess workers and consolidating production. China even injected a modicum of competition, breaking up giant defence SOEs into smaller, contending firms, particularly in the aviation and shipbuilding sectors.

In addition, China has aggressively pursued a dual-use R&D strategy that stresses the development of advanced civilian technologies – particularly in the areas of electronics and information technologies, aviation, space launch vehicles, satellites, and advanced manufacturing – that can be spun-on to defence products and production. Over the past decade, Beijing has worked hard both to encourage further domestic development and growth in these sectors *and* to expand linkages and collaboration between China's MIC and civilian high-technology sectors, and this approach appears to be paying dividends.⁽¹⁶⁾

Finally, the reform of the defence industry must be seen as building on the expansion of state funding committed to defence modernisation more broadly. Arguably, simply throwing more money at the problem may have had the greatest impact on the local defence industry, by increasing procurement and therefore production; by expanding R&D spending; and by subsidising the upgrading and modernisation of arms-manufacturing facilities. Consequently, China's MIC is better suited than ever to absorb and leverage advanced, militarily relevant technologies and therefore provide the PLA with the advanced military systems it requires. In fact, in recent years Beijing has greatly reduced its once-sizable arms purchases from Russia, an indicator that China is getting closer to realising its long-cherished goal of self-sufficiency in arms acquisition.

At the same time, critical weaknesses remain. China's MIC still appears to possess only limited indigenous capabilities for cutting-edge defence R&D, and Western armaments producers continue to outpace China when it comes to most military technologies, particularly in areas such as propulsion and defence electronics. Overall, it is still more of a "fast follower" and niche innovator when it comes to military R&D, though this may be irrelevant if China is only looking to gain asymmetric niche advantages such as using an ASBM to attack aircraft carriers. Nevertheless, the Chinese defence industrial base has made undeniable advancements over the past decade and a half in terms of manufacturing new, relatively modern military systems, and this pace of defence development and production could even quicken in the decades ahead as the lessons of these reforms are incorporated further.

China's military build-up, 1997-2012

With constantly expanding defence resources, the PLA has been engaged in a concerted effort to replace and upgrade its military hardware since at least the late 1990s. Initially, Beijing relied heavily on foreign suppliers, particularly Russia, Ukraine, and to a lesser extent Israel, to meet its immediate requirements for advanced armaments. Since the turn of the century, however, the PRC has increasingly turned to its own indigenous defence industry to provide the PLA with modern weaponry – supplementing this capacity with technologies that have either been reverse-engineered (for example, the J-11B fighter, a clone of the Russian Su-27) or stolen outright from foreign suppliers (e.g., stealth and information technologies).

Consequently, it is reasonable to argue that Beijing has been engaged in something more than the "mere" modernisation of its armed forces over the past decade and a half. The PLA has not just undergone certain qualitative improvements, but in many cases it has added capabilities that it did not possess before, such as stealth, standoff precision-strike, long-range airborne and undersea attack, and expeditionary warfare. In addition, these new war-fighting capabilities have been further enhanced by significant improvements in Chinese military C4ISR infrastructure, including satellites, unmanned aerial vehicles (UAVs), and computer networking. For this reason, it is fair to describe China's military improvements as a "build-up" rather simply a "modernisation drive."

Recent Chinese military thinking has been particularly influenced by the so-called revolution in military affairs (RMA) and concepts of network-centric warfare (NCW). Many in the PLA see considerable potential for force multipliers in such areas as information warfare, the digitisation of the battlefield, and networked systems.⁽¹⁷⁾ At the same time, adversaries who are highly dependent on advanced technology – such as the United States – are seen as susceptible to low-tech countermeasures or attacks on their own command, control, and communications capabilities. Consequently, the PLA has devoted increasing attention to the development of asymmetric responses aimed at enabling "the inferior to defeat the superior."

In particular, China's military is increasingly focused on the information-technologies side of the RMA. According to PLA expert You Ji, the Chinese military is currently engaged as part of an ambitious "generation-leap"

16. See Tai Ming Cheung, *Fortifying China*, Ithaca (NY), Cornell University Press, 2009; and Evan Medeiros, et al., *A New Direction for China's Defense Industry*, Santa Monica (CA), The RAND Corporation, 2005.

17. You Ji, "Learning and Catching Up: China's Revolution in Military Affairs Initiative," in Emily O. Goldman and Thomas G. Mahnken (eds.), *The Information Revolution in Military Affairs in Asia*, New York, Palgrave MacMillan, 2004, pp. 97-123.

strategy in a twin transformational effort to simultaneously pursue both the mechanisation and informatisation of its armed forces.⁽¹⁸⁾ Thus, even as it is attempting to upgrade its current arsenal of conventional industrial age weapons, it is also seeking to incorporate improved communications systems and other high technology capabilities that will enable it to fight informatised conflicts by leveraging net-centric concepts of integration and rapid information exchange.

Of particular note over the past decade and a half has been the PLA's pursuit of weapons for asymmetric warfare, sometimes referred to as "assassin's mace" or "trump card" capabilities.⁽¹⁹⁾ Some of these weapons are designed to strike an enemy's vulnerabilities, such as using computer-network attacks to knock out overhead C4ISR capabilities. Others are basically "old wine in new bottles," that is, existing programs such as fighter-bombers, missiles, submarines, and smart mines that are nevertheless regarded as the most effective weapons in the PLA's arsenal and whose development or deployment has therefore been accelerated. Finally, this category of weapons also includes so-called "new concept" arms, such as kinetic energy weapons (e.g., railguns), lasers, radiofrequency and high-powered microwave weapons, and anti-satellite (ASAT) systems. Most military systems in this last category are still in development, although China did successfully test an ASAT device in 2007.⁽²⁰⁾

With regard to its naval forces, China built six destroyers of three different types between 2000 and 2011, including one class (the Type-052C *Luyang-II*) outfitted with an *Aegis*-type air-defence radar and fire-control system; additional Type-052C destroyers are currently under construction. These vessels are equipped with the indigenous YJ-83 or YJ-62 anti-ship cruise missile (ASCM) and the HN-2 land-attack cruise missile (a variant of the Russian Kh-55 missile). The Type-052C also carries several Chinese-built HHQ-9 surface-to-air missiles (SAM), housed in vertical launch systems (VLS). China has also added at least a dozen new frigates to its forces, including the Type-054 *Jiangkai*-class, which features a stealthy design and is armed with ASCMs and VLS-deployed SAMs, as well as the new-generation Type-022 *Houbei*-class catamaran-hulled missile fast attack craft (outfitted with YJ-83 ASCMs), of which at least 60 have been built.

Rounding out its modern surface fleet, in the late 1990s and early 2000s, the PLA Navy (PLAN) also acquired four *Sovremenny*-class destroyers from Russia. Of particular note, these ships are outfitted with the 3M-80E *Moskit* (NATO designation: SS-N-22 Sunburn) ramjet-powered, supersonic ASCM, which has a range of 120 kilometres; later-model Sunburns have a 200-kilometre range.

China has also greatly expanded its submarine fleet over the past 15 years. Since the late 1990s, the PLAN has acquired 13 Type-039 *Song*-class diesel-electric submarines. The *Song*-class is the first Chinese-built submarine to feature a modern "Albacore" (or teardrop-shaped) hull and a skewed propeller (for improved quieting), and to carry an encapsulated ASCM capable of being fired while submerged (through a regular torpedo tube), as well as an antisubmarine rocket. The PLAN further upgraded its capabilities by fielding the Type-41 *Yuan*-class in 2005. The *Yuan*-class also carries both torpedoes and ASCMs, and some or all of the boats in this class may be equipped with an as-yet unidentified engine (perhaps the Stirling engine, which has been outfitted to Swedish and Japanese submarines) for air-independent propulsion (AIP). So far, four *Yuan*-class submarines have been built, with at least three more under construction. On top of these indigenously-produced vessels, beginning in the mid-1990s, the PRC acquired 12 *Kilo*-class diesel-electric submarines from Russia. Some of these are armed



Song-class submarine.

Credits: military-today.com

with the 3M-54E *Klub* (SS-N-27) ASCM and the 53-65KE wake-homing torpedo. According to some reports, some of the features found in the *Kilo* were incorporated into the *Yuan*-class submarine.

Furthermore, the PLAN has begun replacing its small and aging fleet of nuclear-powered submarines, i.e., five *Han*-class nuclear-powered attack boats (SSN) and one *Xia*-class nuclear-powered ballistic missile-carrying submarine (SSBN). The first in a new class of SSNs, the Type-093 *Shang*-class was launched in 2002 and commissioned in 2006; one additional Type-093 has since also entered service, and some sources estimate that up to eight boats in this class could be built, though other analysts expect that the PLAN will field more advanced Type-095s instead.⁽²¹⁾ The PLAN has also launched two new SSBNs of the Type-094 *Jin*-class, each intended to carry 12 JL-2 submarine-launched ballistic missiles (SLBMs) with a range of 7,000 kilometres (three times greater than that of the JL-1 SLBM carried by the *Xia*) once the JL-2 enters operational readiness.⁽²²⁾

China is also in the process of expanding its capacities for force projection and expeditionary warfare, in particular involving the acquisition of platforms capable of operating fixed-wing aircraft. China has recently launched two Type-071 17,000-20,000 ton LPD (landing platform dock) amphibious warfare ships, capable of carrying two helicopters and two air-cushioned landing craft (LCAC) each, as well as carrying up to 800 troops. Up to eight Type-071s are likely to be built, and some observers have speculated that these may be complemented by a new larger LPH (landing platform helicopter) amphibious assault ship.⁽²³⁾

In perhaps its most dramatic development, the PLAN has recently taken delivery of China's first aircraft carrier: the rebuilt Soviet carrier ex-*Varyag*. A casualty of the Cold War's end, the *Varyag* was laid down in the early

18. You Ji, "China's Emerging National Defense Strategy"; op. cit., see also "Chapter III: Revolution in Military Affairs with Chinese Characteristics," *China's National Defense in 2004*.

19. Jason E. Bruzdinski, "Demystifying *Shashoujian*: China's 'Assassin's Mace' Concept," in Andrew Scobell and Larry Wortzel (eds.), *Civil-Military Change in China*, Carlisle (PA), Army War College, 2004, pp. 309-364; OSD, 2011 Report to Congress, op. cit., p. 22.

20. Mark A. Stokes, *China's Strategic Modernization: Implications for the United States*, Carlisle (PA), Army War College, 1999, pp. 195-213; Craig Covault, "Chinese Test Anti-Satellite Weapon," *Aviation Week & Space Technology*, 17 January 2009.

21. "Type 093 (Shang Class) Nuclear Powered Missile Submarine," *Sinodefence.com*, www.sinodefence.com/navy/sub/type093shang.asp (consulted on 15 December 2011).

22. Ronald O'Rourke, *PLAN Force Structure: Submarines, Ships, and Aircraft*, paper presented to the CAPS-RAND-CEIP-NDU conference on "The Chinese Navy: Expanding Capabilities, Evolving Roles?" pp. 4-9, 13-18; "Type 094 (Jin Class) Nuclear Powered Missile Submarine," *Sinodefence.com*, www.sinodefence.com/navy/sub/type094jin.asp (consulted on 15 December 2011).

23. O'Rourke, *PLAN Force Structure*, p. 19; "Type 071 Landing Platform Dock," *Sinodefence.com*, www.sinodefence.com/navy/amphibious/type071.asp (consulted on 15 December 2011).



Varyag under tow in Istanbul in November 2011 on his way to Macao. Obtained from the U.S. Naval War College report "China's Aircraft Carrier Ambitions: Seeking Truth from Rumors.", Naval War College Review, Winter 2004, Vol. 57, No. 1.

1980s, but construction was halted in 1992 when the vessel was only 70 percent complete. Ukraine, which inherited it after the breakup of the Soviet Union, stripped the ship bare and left it exposed to the elements for several years. When the *Varyag* was finally sold and delivered to China in 2001 – ostensibly to be turned into a Macau casino – it was a rusted shell without engines, a rudder, a weapons systems, or electronics. In addition, the process of removing sensitive equipment from the vessel had resulted in damage to its structure, so that even its seaworthiness was questioned by some. In mid-2005, however, the Chinese moved the *Varyag* to dry-dock at the Dalian shipyard in northeast China, where it underwent substantial repairs and reconstruction, along with the installation of new engines, radars, and electrical systems. The rebuilt ex-*Varyag* carrier underwent its first sea trials under PLAN colours in August 2011.

At the moment, China still lacks carrier-capable fixed-wing aircraft. At one time, the PLAN was rumoured to be interested in purchasing 50 Su-33 fighter jets from Russia, which are flown off Moscow's lone remaining carrier, the *Admiral Kusnetsov*; this sale never materialised, however. Currently, it is believed that the ex-*Varyag* will fly either the so-called J-15 fighter jet (reportedly reverse-engineered from a Su-33 acquired surreptitiously from Ukraine) or a navalised version of the indigenous J-10 combat fighter.

The ex-*Varyag* vessel will likely initially be used more as a research and training platform for future Chinese carrier designs and crews rather than as a fully functioning carrier (although it could be pressed into military service in a limited capacity). China is expected by most naval power analysts to begin construction of several indigenous carriers soon. At one time, the Jane's Information Group speculated that the PLAN could build up to six aircraft carriers. If that happens, it would likely mean the reorientation of the PLAN around Carrier Battle Groups (CVBGs), with the carrier at the heart of a constellation of supporting submarines, destroyers, and frigates – an amalgamation of power projection capabilities such as China has never before possessed. Such CVBGs are among the most impressive instruments of military power in terms of sustained, far-reaching, and expeditionary offensive force, and such a development would constitute a major shift in the PLAN's strategic direction away from mere near-coast defence.

Modernisation efforts for the PLA Air Force (PLAAF) and the naval aviation forces of the PLA Navy (often referred to as the PLA Navy Air Force, or PLANAF) have focused on the acquisition of modern fighter aircraft with advanced air-to-air missiles (AAMs) and air-to-ground weapons, as well as long-range surface-to-air missile systems (which the PLAAF manages as a part of its overall responsibilities for China's air defences). The PLAAF and PLANAF have, over the past 15 years, acquired a large number of so-called "fourth-generation" or "fourth-generation-plus" fighter aircraft, capable of firing standoff active radar-guided medium-range air-to-air missiles or delivering precision-guided air-to-surface munitions. Beginning in 1992, for example, China began to import the Russian-built Su-27 *Flanker* fighter jet; this was subsequently complemented by the purchase of the more advanced Su-30MKK version (first for the PLANAF and later for the PLAAF), and Beijing and Moscow eventually agreed to an arrangement to license-produce the Su-27 (designated the J-11A) at the Shenyang Aircraft Company. All together, the PLAAF and PLANAF have acquired approximately 300 Su-27s and Su-30MKKs, including around 100 J-11As. Additionally, since the early 2000s, the Chinese have been manufacturing a reverse-engineered version of the Su-27 (designated the J-11B), albeit still relying on a Russian-supplied engine.

China is also currently manufacturing its first indigenous fourth-generation-plus combat aircraft, the J-10. The J-10 is an agile fighter jet in roughly the same class as the F-16C, and it features fly-by-wire flight controls and a glass cockpit (but nevertheless equipped with the Russian AL-31 engine, underscoring China's continuing difficulties with developing a usable jet engine). The J-10 first flew in the mid-1990s, and production started around the turn of the century. At least 150 J-10s have been delivered to the PLAAF since the early 2000s, with production continuing at a rate of about 30 aircraft a year; estimates are that the Chinese air force will buy upwards to 300 of these aircraft. Altogether, by 2020, the PLAAF and PLANAF will likely have between 600 and 700 combat aircraft of the fourth-generation or later type.

All of these modern aircraft can fire advanced air-delivered weapons. The PLAAF has purchased the RE-77E (AA-12) active-radar guided air-to-air missile (AAM) for its Su-27s, while the Su-30s can be equipped with the Russian-made Kh-31P anti-radiation missile (for use against radars). The J-10 carries the Chinese-designed PL-12 active-radar AAM and the short-range PL-8, a licensed-produced version of the Israeli Python-3 infrared-guided AAM, as well as laser-guided and satellite-guided bombs, high-speed anti-radar missiles, and air-launched cruise missiles.

In a move comparable to the launching of the country's first aircraft carrier, China has recently unveiled a purportedly "fifth-generation" combat aircraft, the J-20. The J-20, which had its first flight in January 2011, nominally resembles the US F-22, although the actual details of this aircraft – how stealthy is it, how advanced its radar and other avionics are, what kind of sophisticated weaponry it carries, etc. – are sketchy. Consequently, one should be careful not to read too much into this program.⁽²⁴⁾ At the same time, the J-20 demonstrates China's ambitions to enter the vanguard of advanced fighter-jet producers.

More than most countries, the Chinese military relies heavily on ballistic missile systems for long-range precision-strike, although these are increasingly being supplemented by new land-attack cruise missiles (LACMs). Be-

24. "J-20 vs. F-35, one analyst's perspective," Defensetech.org, 31 December 2010 <http://defensetech.org/2010/12/31/j-20-vs-f-35-one-analysts-perspective> (consulted on 15 December 2011).

ginning in the mid-1990s, for example, China began acquiring conventionally-armed short-range ballistic missiles (SRBMs, missiles with ranges of less than 1,000 kilometres), mostly CSS-6/DF-15s and CSS-7/DF-11s, at a rate of about 50 to 75 missiles a year. By late 2010, the PLA's Second Artillery (the arm of the Chinese military that controls the country's nuclear and conventional missile forces) was estimated by the US DoD to have deployed approximately 1,000 to 1,200 SRBMs, most of which were arrayed opposite Taiwan.⁽²⁵⁾ China's conventional ballistic missile capabilities, moreover, have expanded into the medium-range category – that is, those missiles with ranges between 1,000 and 3,000 kilometres. The more recent versions of these missiles, such as the GPS-guided CSS-5/DF-21C, are believed to be accurate enough to hit targets such as airfields and ports, and can carry a variety of warheads, including conventional high explosive, anti-armour submunitions, and fuel air explosives.⁽²⁶⁾ In addition, China's Second Artillery has fielded around 150-350 conventional, ground-launched LACMs, such as the DH-10, with a range of 2,000 kilometres or more, that are even more accurate.⁽²⁷⁾

Considerable attention has been paid of late to the DF-21D anti-ship ballistic missile (ASBM). The first of its kind, the DF-21D ASBM combines a manoeuvrable re-entry vehicle (MARV) with a terminal guidance system, has a range of 1,500 kilometres, and is capable of hypersonic (Mach 5 and above) speeds.⁽²⁸⁾ This makes the missile potentially effective against slow-moving carrier battle groups, and has earned the DF-21D the nickname "the carrier-killer." According to the US DoD, the DF-21D appears to be a "workable design" and has been deployed in small numbers, having achieved "initial operating capability."⁽³⁰⁾

Regarding China's nuclear strategic forces, the Second Artillery currently operates approximately 55-65 intercontinental ballistic missiles (ICBMs), up from around 20 ICBMs a decade ago.⁽³⁰⁾ These systems include the silo-based SS-4/DF-5 Mod 2, as well as the solid-fuelled, road-mobile CSS-10/DF-31. Improved versions of these ICBMs are expected to be deployed by the middle of this decade.⁽³¹⁾ Additionally, China's land-based ICBMs are complimented by a growing number of sea-launched missiles, particularly the JL-2 SLBMs, of which 24 are currently deployed on two *Jin*-class SSBNs.

Finally, the PLA has paid considerable attention over the past 15 years to expanding and improving its capabilities for C4ISR (command, control, communications, computing, intelligence, surveillance, and reconnaissance) and for information operations/information warfare. Developing an advanced C4ISR system is a high priority for the Chinese military; accordingly, the PLA has created a separate military communications network using fibre-optic cable, satellites, microwave relays, and long-range high frequency radio. The PLA has also acquired several types of unmanned aerial vehicles and expanded its constellation of space-based systems, including the *Haiyang*, *Yaogan*, and *Huanjin* remote-sensing satellites, the *Beidou* navigation satellite system (which just came online in late 2011), and the *Fenghuo* military communications satellite.⁽³²⁾ In addition, similar to the US Army's "Future Force Warrior" program, the PLA is reportedly experimenting with digitising its ground forces, right down to outfitting the individual soldier with electronic gadgetry in order to provide him with real-time tactical C4ISR.

Concurrently, the PLA is expanding its capabilities to wage "offensive information warfare" (OIW). OIW is intended to disable or degrade an enemy's C4ISR system to such an extent that he is either deterred from fighting or, once at war, that his ability and resolve to fight back is weakened to the brink of capitulation. OIW is seen as a critical new development in the PLA's emerging war-fighting capabilities. The PLA is developing oper-



Chinese sources report the ground launched CJ-10 to be the GLCM variant of the DH-10 design, carried on a three round TEL (Chinese Internet).

Source: <http://www.ausairpower.net/APA-PLA-Cruise-Missiles.html#mozToclid838105> (consulted on 13 December 2011).

ating concepts of "integrated network electronic warfare," an amalgam of operations including electronic warfare (such as jamming the enemy's communications and intelligence-gathering assets), computer network operations (such as hacking or disrupting the enemy's computers and cyberspace operations), and even physical attacks on the enemy's C4ISR infrastructure (strikes against sensors such as AWACS and satellites, or against information nodes such as command posts).⁽³³⁾ The PLA has established special information warfare units to carry out attacks on enemy computer networks, in order to blind and disrupt an adversary's C4I systems.

In many instances, the PLA's efforts at "informatisation" have benefited from leveraging advances and improvements in China's rapidly expanding commercial information technology sector. China's military telecommunications satellites, its *Beidou* navigation satellite system, and its *Yaogan* series of reconnaissance satellites are all based on commercial satellite technologies, for example. In particular, many of the technologies being developed for commercial remote sensing satellites, such as charge-coupled device cameras, multispectral scanners, and synthetic aperture radar imagers, have obvious applications for military systems. Similarly, much of the hardware and skill base for conducting information warfare is dual-use in nature, and the Chinese military has benefited from piggy-backing on developments and growth in the country's commercial IT industry.

25. OSD, *2011 Report to Congress*, *op. cit.*, p. 30.

26. "Dongfeng 21," <http://www.sinodefence.com/space/missile/df21.asp>, Sinodefence.com, (consulted on 15 December 2011).

27. "DF-11 (CSS-7/M-11)," *Jane's Strategic Weapon Systems*, 26 June 2009; "DF-15 (CSS-6/M-9)," *Jane's Strategic Weapon Systems*, 26 June 2009; "DF-21 (CSS-5)," *Jane's Strategic Weapon Systems*, 26 June 2009; Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China 2009*, Washington, US Department of Defense, March 2009, p. 66.

28. Wendell Minnick, "China Developing Anti-Ship Ballistic Missiles," *Defense News*, 14 January 2008.

29. Tony Capaccio, "China Has 'Workable' Anti-Ship Missile Design, Pentagon Says," *Bloomberg*, 26 August 2011, www.bloomberg.com/news/2011-08-25/china-has-workable-anti-ship-missile-design-pentagon-says.html (consulted on 15 December 2011).

30. OSD, *2011 Report to Congress*, *op. cit.*, p. 34.

31. *Ibid.*

32. "China's Satellite Program," www.sinodefence.com/space/satellite, Sinodefence.com (consulted on 15 December 2011).

33. Jacqueline Newmyer, "The Revolution in Military Affairs with Chinese Characteristics," *Journal of Strategic Studies*, vol. 33, no. 4, August 2010, pp. 488-490; OSD, *2011 Report to Congress*, p. 25; You Ji, "China's Emerging National Defense Strategy," Wendell Minnick, "China Shifts Spending Focus to Info War," *Defense News*, 11 September 2006.

Professionalisation and training of PLA personnel ⁽³⁴⁾

China is combining its force modernisation efforts with actions intended to increase the professionalisation and jointness of the PLA. PLA officers and non-commissioned officers (NCOs) are receiving increased training and education, while recent military exercises have emphasised amphibious warfare with limited multi-service participation. PLAAF and PLANAF training regimens increasingly devote more time to supporting amphibious operations, while PLA ground forces are increasingly integrating training and exercises with maritime, airborne, and special operations forces. ⁽³⁵⁾

China has been improving personnel quality along several dimensions. One is improving the educational background of new officers and enlisted personnel. Today, to be inducted into the PLA as an enlisted person, recruits from rural areas must have at least graduated from middle school, and those from urban areas must have graduated from a vocational high school or three-year technical college, or be enrolled in a four-year college. ⁽³⁶⁾

Officers in the PLA used to be drawn from the ranks of enlisted personnel. Some were promoted directly to become officers while others were sent to one of the PLA's 30 or so military academies. Direct promotions have ended, however, and those remaining officers who were directly promoted have been required to attend military academies. More importantly, approximately half of the PLA's officers are now recruited from civilian universities, which are regarded as providing higher quality education than the PLA's academies. ⁽³⁷⁾

Another aspect of the PLA's efforts to improve the quality of its personnel is the creation of an NCO corps. The vast majority of these are enlisted personnel who volunteer to reenlist after the end of their initial two-year commitment. As of 2008, all NCOs must have at least a high-school education and a "certificate of professional qualification." Diplomas from vocational high schools and technical colleges are considered acceptable, but those NCOs who are not high school graduates or who do not have a diploma from a vocational high school or technical college are sent to PLA academies or to civilian colleges, research institutes, and industrial colleges to receive the requisite training. In addition to satisfying these minimum education requirements, NCOs receive further education and training throughout their careers in the PLA, and senior NCOs (those who reach the top two of six total NCO grades) are required to have a degree from a three-year technical college. ⁽³⁸⁾

In addition to improving the quality of its soldiers and officers, the PLA is attempting to improve the quality of its training by increasing the realism, complexity, and "jointness" of its exercises. Traditionally, training was conducted in small units belonging to a single branch (e.g., infantry, frigates, or fighter aircraft), and was performed in benign conditions that included familiar terrain, daylight, and good weather. Moreover, training exercises were done either without an opposing force or with opposing forces whose actions were predetermined and briefed to the force being trained ahead of time. Now, however, training is routinely conducted on unfamiliar terrain, at night or in bad weather, and against opposing forces whose actions are not predetermined. The frequency of combined-arms (different branches within a single service) and joint (different services training together) training has also increased, as has the scale of the exercises. Some training areas now have dedicated opposition forces that simulate the tactics of potential adversaries and are even allowed to defeat the visiting unit. Finally, rigorous evaluation and post-exercise critiques have become an integral part of PLA

training, with units required to meet standardised performance benchmarks or else undergo remedial training. ⁽³⁹⁾

Conclusions

China has been engaged in an ambitious, concerted, and methodical transformation of its armed forces since the late 1990s. China's recent military acquisitions, as well as its current R&D efforts, particularly its emphasis on "trump card" weapons for asymmetric warfare, have been critical developments in the upgrading of its war-fighting capabilities. At the same time, the PLA has made considerable progress over the last 15 years in enhancing the professionalism of its military personnel, and in expanding its training and making it both more realistic and more joint. Consequently, China has noticeably improved its military capabilities in several specific areas – particularly missile attack, precision-strike, power projection at sea and in the air, and joint operations. The Chinese armed forces have also made significant advances in exploiting informatisation, in promoting the development of advanced weaponry, and in accelerating the pace of military modernisation, all of which create new levers of military power for the PLA. Ultimately, the PLA seeks to turn itself into a modern, network-enabled fighting force, capable of projecting sustained power throughout the Asia-Pacific region. If successful, China's military modernisation drive will give the country the potential, in the US Department of Defense's words, to "pose credible threats to modern militaries operating in the region." ⁽⁴⁰⁾

At the same time, the PLA continues to suffer from a number of deficiencies and weaknesses that limit its ability to constitute a major military threat to advanced militaries such as the United States armed forces. In the first place, for all of its talk of becoming a more networked military, the PLA is still decidedly a *platform*-centric force that is still in the process of becoming more network-enabled. Second, despite more than 15 years of continuous defence spending increases and at least a decade of aggressive acquisitions on the part of the PLA, the bulk of the Chinese military remains relatively backward. Overall, barely 25 percent of the PLA's fighter aircraft, 25 percent of its surface combatants, 40 percent of its surface-to-air missiles, and 55 percent of its submarine fleet are deemed by the US Department of Defense to be modern. ⁽⁴¹⁾ Even many of the PLA's most recently acquired systems, such as the J-10 fighter jet, the *Yuan*-class submarine, and the *Luyang-II* destroyer, although advanced by the PLA's standards, are basically 1980s-era weapons systems. The J-10 fighter jet, for instance, is basically equivalent to the F-16C, which entered service in the mid-1980s. Even equipment that China has acquired from Russia – such as Su-30MKK fighters, *Sovremenny*-class destroyers, and *Kilo*-class submarines – are hardly transformational, game-changing systems. Finally, it

34. This section draws in part on Richard A. Bitzinger and Roger Cliff, "PLA Modernization: Motivations, Directions, and the Revolution in Military Affairs," in Mingjiang Li and Dongmin Lee (eds.), *China and East Asian Strategic Dynamics*, Lanham (MD), Lexington, 2011, pp. 31-32.

35. See, for example, Dennis J. Blasko, *The Chinese Army Today*, New York, Routledge, 2006, pp. 91-120, 144-170; OSD, *2011 Report to Congress*, *op. cit.*, p. 24.

36. David E. Johnson, et al., *Preparing and Training for the Full Spectrum of Military Challenges: Insights from the Experiences of China, France, the United Kingdom, India, and Israel*, Santa Monica (CA), RAND Corporation, 2009, p. 29.

37. *Ibid.*, pp. 32-33.

38. *Ibid.*

39. *Ibid.*, pp. 46, 50-51.

40. Office the Secretary of Defense, *Annual Report on the Military Power of the People's Republic of China 2006*, Washington, US Department of Defense, 2006, p. i.

41. OSD, *2011 Report to Congress*, *op. cit.*, p. 43.

is worth remembering that the bulk of the PLA ground forces are still equipped with old or obsolete weaponry; only about a third of the PLA's 7,500 main battle tanks are the relatively modern Type-96 and Type-99 – the remainder being Type-59 and Type-69 tanks based on the 1950s-era Soviet T-54. Other types of modern ground systems – including infantry fighting vehicles, self-propelled artillery gun systems, helicopters, anti-tank guided missiles, and surface-to-air missile systems – are only gradually being introduced in modest numbers.⁽⁴²⁾ In sum, the capabilities gap between the PLA and the US military remains wide, even as the PLA is posing new problems for regional militaries that do not have the aggregate power or budget of the US armed forces.

Moreover, the technology gap between China's defence industry and the leading Western arms producers remains significant in several critical areas. This is particularly apparent in China's continued reliance upon foreign suppliers for propulsion systems, especially engines for its naval forces, as well as turbofan jet engines used to power modern military aircraft and transports. China's largely indigenously-built J-10 fighter, for example, still uses AL-31FN engines imported from Russia.⁽⁴³⁾ One should also keep in the mind that many advanced weapons programs, such as its aircraft carrier or its J-20 combat aircraft, are still in the developmental stage, and actual deployment remains years, perhaps even a decade or more, away. Additionally, the US DoD has reported that the JL-2 SLBM has experienced a "number of problems," and that its in-service date remains "uncertain."⁽⁴⁴⁾ Finally, China continues to lag far behind the West in areas such as C4I architectures and surveillance and reconnaissance capabilities.

Operationally, it is important to note that the PLA remains overwhelmingly a ground forces-dominated military. Top leadership positions in the Chinese armed forces are dominated by the Army – and the Army is made up mostly of modestly-armed infantry troops, at that. In short, large segments of the PLA today remain incapable of much in the way of mobility or expeditionary capacities. The PLA still lacks the logistical and lift capacity, either by sea or by air, required for projecting force far beyond its borders or immediate ocean areas. It still has the capability to sea- and airlift only two or three regiments of soldiers and marines at any given time, and the PLA still possesses little in the way of sustained logistical abilities, particularly over long distances (although the PLA Navy continues to expand its fleet of amphibious and logistics vessels, including the launch of its first hospital ship in 2010). Finally, the PLA "continues to face deficiencies in inter-service cooperation and actual experience in joint exercises and combat operations," making the attainment of a joint operations capability – let alone an integrated joint operations capability – rather remote for the time being.⁽⁴⁵⁾

All these problems aside, however, it is undeniable that the Chinese military has made impressive gains in upgrading and improving its military capabilities over the past 15 years. Moreover, the pace of this modernisation process does not yet appear to have abated. And while PLA modernisation has not been across-the-board, it may also not be necessary for it to constitute a modern fighting force. Many have speculated that the Chinese are basically engaged in building an "army within an army," that is, a relatively small force – approximately a dozen division- or brigade-sized rapid reaction units, including three airborne and four amphibious or marine divisions, as well as special operations forces – equipped and trained to carry out rapid attacks. The forces will be supported in turn by the more advanced elements of the rest of the PLA, such as precision-strike missile forces, fourth-generation fighters, modern surface and submarine forces,

and surface-to-air missiles systems, all backed up by an increasingly capable C4ISR network and an offensive information warfare capability. Such a force would mostly likely be used to attack and defeat Taiwan, while also deterring or defeating US intervention on Taipei's behalf. Such capabilities could also be applied to other regional contingencies, such as territorial disputes in the South China Sea.⁽⁴⁶⁾

So while Chinese military power may still pale in comparison to the US armed forces, the strength of the PLA relative to its likely local competitors in the Asia-Pacific region has increased significantly, and will likely continue to grow over the next ten to 20 years. As a result, China is definitely gaining an edge over other regional militaries in the Asia-Pacific, particularly Taiwan and perhaps even Japan and India.⁽⁴⁷⁾

Naturally, many of Beijing's neighbours have looked upon China's growing hard power and its "creeping assertiveness" in the South China Sea with a certain amount of trepidation. Some are attempting to hedge against a rising China by engaging in their own military build-ups. In particular, India and several nations in Southeast Asia have over the past decade or so been engaged in their own often intensive efforts to modernise their armed forces. As a result, these countries have added new or expanded military capabilities that can be directed against any potential "China threat." India is in the midst of upgrading its navy, acquiring several large surface combatants – including two aircraft carriers – and more than a dozen new submarines (both nuclear- and conventionally powered), as well as buying hundreds of new fighter jets. Singapore, Malaysia, Indonesia, and Vietnam are all acquiring submarines and new warships, modern anti-ship cruise missiles, fourth-generation-plus fighter jets, and stand-off air-launched weapons. The challenge to Beijing, of course, is that it may be instigating an arms race where it does not seek one, especially with regard to India, which increasingly sees itself in a rivalry with China for great-power status in the Asia-Pacific. And even if the smaller states in Southeast Asia cannot hope to match China's military force, they at least aspire to blunt this power, particularly when it comes to their own claims in the South China Sea.

In sum, it is readily apparent that China has made significant – perhaps even unexpected – progress in building up its military power over the past 15 years. And because China's rise is so recently tainted with a growing self-assertiveness (both verbally and policy-wise) bordering on belligerence, its growing military capabilities have injected new uncertainties into the regional security calculus. At the same time, Chinese military power still possesses several weak links that mitigate its effectiveness. It could be argued that China is growing in hard power just enough to potentially destabilise regional security – particularly if it chooses to use military power to press its claims and interests; at the same time, it is not yet powerful enough militarily to actually resolve these issues. This is, to say the least, a delicate balance that is fraught with peril and the potential for conflict.

42. "Ground forces," www.sinodefence.com/army/default.asp, Sinodefence.com (consulted on 15 December 2011).

43. Evan S. Medeiros et al., *A New Direction for China's Defense Industry*, Santa Monica, RAND, 2005, p. 170.

44. OSD, *2011 Report to Congress*, op. cit., p. 34.

45. *Ibid.*, p. 27.

46. Timothy Hu, "China – Marching Forward," *Jane's Defence Weekly*, 25 April 2007.

47. China now outspends Japan on defence by a factor of nearly two to one, and the PLAN has more destroyers, frigates, and attack submarines than the Japan Maritime Self Defence Force.