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China's Military Reforms and Modernization: Implications for the United States

The Commission and the Department of Defense annually produce some of the most important products available to China researchers, providing a baseline of reliable information which encourages further research. I intend to enhance this knowledge using key Chinese language sources, consultations with other PLA researchers, and my experience working with the People's Liberation Army (PLA) bureaucracy. In particular, I have answered the Commission's questions with a focus on the Chinese government's own beliefs about and intent for building the PLA Army (PLAA), which is too easily lost in translation.

1. How has China's military reform effort (including the creation of the Strategic Support Force and Joint Logistics Force) affected ground force modernization efforts?

When Chinese president Xi Jinping restructured the People's Liberation Army (PLA) in 2016, we in the West focused on the reorganization of the Central Military Commission (CMC) and PLA as inaugurating a new era for PLA joint operations. While such changes will create a more rational force structure and operational concepts in years to come, Xi's first goal was to consolidate his hold on China's military apparatus, the final guarantor of Chinese Communist Party (CCP) power over the country. His coups de grace came with his abolition of the four General Departments and establishment of Theater Commands. As we shall see, this shifted the ground force from a position of preeminence to one of parity with its sister services.

The former General Departments (Staff, Political, Logistics, and Armaments or GSD, GPD, GLD, and GAD, respectively), all headed by powerful CMC-member Army officers, were noted for their corruption. Most prominent were the selling of rank (GPD) and procurement fraud (GLD and GAD). Xi broke up of the four General Departments into 15 smaller joint departments, consolidated their successor organizations directly under the CMC, and kept their new directors off the CMC, thus creating structural checks on their ability to profit from their power.[1] This combined with a renewed system of discipline inspection and an anti-corruption campaign[2] mean that PLA officers can no longer run their departments as "independent kingdoms." Making the major departments smaller and preventing CMC members from controlling them leaves Xi in a position of significantly greater control.

Beyond the CMC, the Army's Military Regions (MRs) were another key target of structural reform. The seven former MRs were the Army's geographic commands, responsible for ground forces and missions in

[1] Ben Lowsen, "US Experts Talk Chinese PLA Reform," *The Diplomat*, March 23, 2016 (https://thediplomat.com/2016/03/us-experts-talk-chinese-pla-reform/, accessed February 8, 2018).

[2] Song Shaohui, ed, "郭伯雄、徐才厚贪腐问题不是他们问题的要害 [Guo Boxiong, Xu Caihou: Corruption Is Not the Greatest of Their Problems]" *PLA Daily*, May 27, 2016.

their areas. The MRs were the backbone of the PLA's force structure, with other services' geographic chiefs appointed as deputies to the Army's MR commanders. Although the MR commanders did not habitually command other services' forces, the symbolism was clear: Army came first and Army's ground missions formed the basis for PLA operations, as they had since the foundation of the PRC. Beyond that, I suspect Army's prestige and deep pockets endeared its leaders to the local CCP officials, creating a feedback loop confirming the indispensability of Army largess.

With the reform, the CMC has abolished the seven Army MRs and replaced them with five joint Theater Commands (TCs) as the primary defenders of national territory. PLAA forces have been relegated to being a single service component among the TC forces, commanded from Theater Army headquarters established *de novo* in new cities. Furthermore, China has very publicly ousted a number of officers previously seen as up and coming[3] as well as publicizing the suicide of several senior officers caught in its anti-corruption dragnet.[4] These structural reforms may not have been enough to change the culture of corruption entirely, but they have surely broken the power of "Big Army."

This has in turn speeded implementation of other reforms:

(1) The most significant reduction in force size of all the services;[5]
(2) Deactivation of five group armies, reducing the number to 13 from 18;
(3) Continued conversion of divisions into brigades as the primary unit building block;
(4) Emphasis on mobility, ensuring a higher proportion of helicopter and special operations units, including the planned expansion of the PLAN Marine Corps to 40 thousand troops from 12 thousand.[6]

Dennis Blasko, a leading PLA researcher who follows the development of ground units closely, characterized the reform as follows:

> If judged by the type and complexity of training conducted in 2016 and 2017, ongoing reform has resulted in a short-term reduction in operational readiness in the hope of increased combat effectiveness by 2020 and beyond. The degree of chaos and anxiety in the Army has been unprecedented over the last two years as demonstrated by:[7]
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> (1) Assigning new commanders and political commissars to all 13 new group armies; of the 26 new leaders, 22 were transferred from outside the TC's area of responsibility;
> (2) Cutting over 1,000 units at the regiment level or above;

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[3] "Xi Jinping appoints new man to tackle PLA corruption," *South China Morning Post*, March 2, 2017 (http://www.scmp.com/news/china/diplomacy-defence/article/2075243/china-replaces-top-general-charge-tackling-military, accessed February 4, 2018).
[4] "Military casualties: top Chinese officers to die since the launch of Xi Jinping's anti-graft drive," *South China Morning Post*, November 28, 2017 (http://www.scmp.com/news/china/diplomacy-defence/article/2121990/military-casualties-top-chinese-officers-die-launch-xi, accesed February 4, 2018).
[5] Ya Mei, ed. "Facts and Figures on China's military reform," *Xinhua Net*, December 19, 2017 (http://www.xinhuanet.com/english/2017-12/19/c_136837189.htm, accessed February 8, 2018).
[6] "Reform of China's army enters a new phase," *The Economist*, August 3, 2017 (https://www.economist.com/news/china/21725812-overhaul-says-lot-about-xi-jinpings-governing-style-reform-chinas-army-enters-new-phase, accessed February 4, 2018).
[7] Email from Dennis Blasko to Ben Lowsen, January 17, 2018.

(3) Moving over 100 brigade and regiment-level units to new locations;
(4) Transferring over 90 percent of military officers from the original group armies and 40 percent from combat brigades to different units;[8]
(5) The number of trans-regional exercises dropped from a peak of 29 in 2015[9] before organizational reforms began, to only 15 in 2016[10] and to about 10 in 2017,[11] many of which were not reported in the military media as in prior years.

Although Jiang Zemin's crackdown on PLA business interests achieved some success in the 1990s, Xi's consolidation has gone further, giving him a level of control not seen since Deng Xiaoping's military reforms in the 1980s.[12] Politics notwithstanding, the new organizational structure does appear to be oriented toward a more rational, modern, and truly joint military force. Thus, it is likely that the most salient effects of the reform on modernization have been general disruption in the short term, with a more rational, tightly controlled, and trimmed down Army organization in the future.

2. What are the implications of the establishment of a PLA Army (PLAA) Headquarters for ground force modernization?

Often when we speak of military modernization, we are referring to weapons and equipment. The corresponding People's Liberation Army concept of "military development" (also translated as "army building") includes the development of military theory, weapons and equipment, system and organization, and talent building.[13] Of these, however, the hardware remains the most expensive to develop, although the "software" components may present problems if not adequately carried out.

In theory, having a headquarters dedicated to developing ground forces, unencumbered by the need to develop joint forces, may allow a new level of PLA specialization in the ground domain. However, even the previous system had ground-focused offices mostly separate from those working on other domains. Most importantly, PLAA's reform leaves it in a place of diminished importance.

The previous Military Region structure made Army forces the principal military units. This accorded with PRC history in which the government repeatedly looked to its land forces to establish and enforce its

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[8] Ya Mei, ed., "Facts and Figures on China's military reform."
[9] 高清：解放军今年重大实战化演习一场接一场 [Gao Qing: This Year's Massive Realistic PLA Combat Exercises, One After Another]," *Renminwang*, December 30, 2015 (http://military.people.com.cn/n1/2015/1230/c1011-27995904.html, accessed February 8, 2018).
[10] Fan Yongqiang, Li Dayong, Fu Xiaohui, "中国陆军怎样走过"军改元年"[How China's Army Celebrates a 'Military Reform New Year]," *Xinhua Net*, January 1, 2017 (http://www.xinhuanet.com/mil/2017-01/05/c_129433633.htm, accessed February 8, 2018).
[11] Pan Zidi, ed., "中国军队２０１７：打造实战化训练"升级版"[China Military 2017: Creating a Realistic Training Exercise "Promotion Edition"], *Xinhua Net*, December 27, 2017 (http://www.xinhuanet.com/2017-12/27/c_1122176158.htm, accessed February 8, 2018).
[12] Ben Lowsen, "The 19th Party Congress and Its Implications for the PLA," *East-West Institute*, November 14, 2017 (https://www.eastwest.ngo/idea/19th-party-congress-and-implications-pla-and-china-us-military-relations, accessed February 8, 2018).
[13] Hao Yuqing, Cai Renzhao, eds., *军队建设学 The Science of Military Development* (National Defense University Press, 2003), 273.

governance: first by defeating the Kuomintang Nationalists, then by maintaining order during the Great Leap Forward famine, Cultural Revolution chaos, the Soviet nuclear scare, Deng's coup to oust the Maoist remnant, and finally the battle to maintain power during Tiananmen in 1989.

Against the backdrop of reliance on the ground forces, naval and air forces played second fiddle at best. Since 1989, however, China has upgraded its PAP Force to be able to deal with nearly all civil disturbances, lessening if not eliminating its ultimate reliance on the Army to keep its grasp on governance. Moreover, China's geographically expanding economic interests have given new impetus to its strategic force projection services: PLA Navy (PLAN), PLA Air Force (PLAAF), and even its reorganized PLA Rocket Force (PLARF). Hu Jintao codified their new importance in his 2004 declaration of "Historic Missions of the Armed Forces in the New Period of the New Century," abbreviated "New Historic Missions" in Western sources. Today, China's expanding technological base is pulling the PLA into the cyber age, as embodied in the newly established Strategic Support Force (PLASSF).

To be sure, PLAA is responsible for its own piece of these expanding interests: peacekeeping, humanitarian assistance, and disaster relief in regions newly important to China, as suggested in the movie *Wolf Warrior II*. And of course the old missions of Taiwan conquest and territorial defense are still PLAA's primary missions. But the bottom line is clear: PLAA must now share its pedestal with the other services.

Xi's inclusion of other services' members on the CMC, downsizing, a decreasing share of high profile missions, and increased distance from decision makers mark the PLA Army's lower status. The new organizational structure enforces this by placing Army units on the same level as their sister services' units under the overall control of the joint Theater Commands. While the old Army MRs reported directly to the General Staff Department, headed by a CMC member, the new Theater Armies must first report through their TCs and the Joint Staff Department, both falling below CMC level. Gen. Li Zuocheng, chief of the Joint Staff Department and former Army commander, put it this way: "The size of the ground force has been greatly reduced to account for less than half of the armed forces… The army is getting fit as it turns modern and strong."[14]

3. What are the modernization priorities for the ground force as the PLAA pursues the "new-type army" concept?

The "new-type army" concept is Xi's vision for a repurposed PLAA, describing its advent as a "phoenix nirvana," meaning a radical and painful transformation. The painful part for the Army is assuming its less exalted role. The transformational part was best described by two Chinese military theorists in a recent article titled "Realizing the 'New' is Key to Establishing a Strong, Modern New-Type Army."[15] Published on the website of China's Ministry of National Defense, it calls for the PLA to adapt to the

[14]Ouyang, ed., "Xi reviews troops in field for first time," *Xinhua Net* (http://eng.mod.gov.cn/news/2017-07/30/content_4787294.htm, accessed February 4, 2018)

[15] Dai Yue and Ye Zheng, "建设强大现代化新型陆军，关键是实现一个"新"字 [Realizing the "New" is Key to Establishing a Strong, Modern New-Type Army]", *PLA Daily*, December 28, 2017 (http://www.xinhuanet.com/mil/2017-12/28/c_129777215.htm, accessed February 4, 2018).

fundamental changes of a period of comprehensive digitization and networking (信息化时代, also translated "informatization") in the areas of mobility warfare, three-dimensional attack and defense, top-flight design and leadership management, organizational and structural improvement, and the transition from linear to three-dimensional operations and from local defense to regional operations.

This last marks a fundamental change to the former operating concept of "winning informatized local wars."[16] It implies the capacity to fight battles of a greater scale, more geographically dispersed, and more technically oriented than the small-scale, localized skirmishes previously envisioned.

The treatise then lists four "News" that the PLA must carry out:

(1) New disposition, referring to the tactical positioning of Army forces. The article uses this analogy: "strategic positioning is using the Chinese Go form of attack by encirclement - 'me within you and you within me' - making the traditional linear battlefield non-linear." In more practical terms, this means highly dispersed forces: "making a squad disperse out over a square kilometer, or an artillery battery over several square kilometers, making detection difficult."

(2) New abilities, particularly in the realms of network and artificial intelligence (AI) warfare. It specifically lists an operational automatic cloud computing control system; AI-enhanced, goal-oriented operations, AI goal testing, AI-assigned tasking, AI organizational operational coordination, AI battle damage assessment, and maximizing our combat ability through the comprehensive "human-in-the-loop" control (i.e. human-machine pairing).

Joint operational capabilities based on network information systems, moving from digitized and networked to AI plus humanization:

Specific capabilities mentioned are digitalization, multi-dimensionality, specialization, autonomous construction; specialized operational forces, multi-dimensional attack Army aviation, combined attack and defense network operational forces, highly effective autonomous forces, highly integrated anti-aircraft and anti-missile forces, joint reconnaissance and warning forces; accurate sensing, command, strike, assessment, and combat support capability; improve three-dimensional attack, quick reaction, long-distance mobility; improve special operations, removal of enemy strongholds and seizure of key terrain, and strategic sabotage.

(3) New posture, meaning the formation of integral combat power on the field of modern warfare. The treatise frames modern warfare in terms of "system vs. system,"[17] two ways of war competing with one another on a single, very broad battlefield in which integration of forces is key. I believe the Chinese concept of such a warfare system is reflected in the movie *Hero*, in which troops are trained to act mechanistically such that their effects become standardized and reliable. However, such a systematized approach actually runs counter to the nonlinear battlefield.

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[16] *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2017*, (hereafter "CMPR") U.S. Department of Defense, 2017, p. 39.

[17] Cf Jeffrey Engstrom, *Systems Confrontation and System Destruction Warfare: How the Chinese People's Liberation Army Seeks to Wage Modern Warfare* (RAND Corporation: Santa Monica, CA, 2018).

For PLAA, the system for modern warfare means modularity: multiple brigade-based arms able to task organize as needed into multi-functional, ad hoc formations. The goal is to develop a robust, integral, and multi-functional force with "plug and play" adaptability, increasing Army's contribution to the whole military's combat power. The suggestion that the Army at present is inadequately contributing to the joint force suggests dissatisfaction with its focus on traditional missions and a push to make it both modernize and take on the full complement of modern missions.

This requires a joint orientation, command information systems, organic fusion of key elements, seamless integration of separate units, and the orderly coordination of separate operations to create an operational system of dispersed deployment, networked convergence, and timely generation of capability.

(4) New method. The treatise quotes Sun Tzu: "Those skilled in defense conceal themselves in the lowest depths of the Earth. Those skilled in attack move in the highest reaches of the Heavens. Therefore, they are able to protect themselves and achieve complete victory."[18]

The treatise calls for revolutionary innovation in operational art to create a new type of army. This innovation is to occur through three-dimensional attack and defense and regional mobilization. The example of this innovation given is developing an integrated air-land noncontact style of fighting based on individual soldiers.

Non contact warfare refers to using technology and autonomous aerial vehicles equipped with sensors and appropriate offensive weapons for ground combat. Individual soldiers are no longer direct combatants but rather high-tech equipment operators.

The example given is of an individual soldier controlling an unmanned aerial vehicle loaded with 20-50 kg of equipment. A squad of these soldiers is no longer limited to controlling a few hundred meters, but can control two to three square kilometers. Such a platoon can control 16 square kilometers.

Within this area, a soldier controlling a UAV can destroy main battle tanks, artillery, and other ground targets. Companies of these platoons formed into brigades or regiments will constitute a great advance in ground warfare.

One question the treatise fails to answer is why a soldier who relies primarily on sensors and remotely piloted vehicles needs to be present on the battlefield at all. The focus seems to be on creating a super ground warrior rather than a modern ground war machine. Thus, although the treatise is forward-looking in emphasizing network and sensor warfares, it still retains the marks of an Army bureaucracy committed to fielding a force.

Blasko saw PLAA priorities as follows:[19]

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[18] Sun Zi, *The Art of War*, translation by Sonshi Group (https://www.sonshi.com/original-the-art-of-war-translation-not-giles.html, accessed February 4, 2018).
[19] Email from Dennis Blasko.

(1) Create combined arms brigades and battalions which integrate organic armor, artillery, air defense, chemical defense and engineer, and operational/logistics support;
(2) Standardize the group army structure, giving each group army six combined arms brigades supported by additional Army aviation/air assault and special operations forces;
(3) Retain the six independent infantry divisions, not subordinate to group armies but rather one to the Central Theater Army, four to Xinjiang MD, and one to Beijing Garrison;
(4) Make combined arms battalions (合成营) the "basic combat unit" (基础战术单元) capable of independent actions on the battlefield; battalion staffs have been formed in the reforms since April 2017;
(5) Improve trans-regional and global force projection capabilities with the support of PLAN, PLAAF, and civilian assets;
(6) Develop air assault capabilities;
(7) Develop the capability to control close-air-support delivered by Army aviation or PLAAF assets;
(8) Develop SOF, reconnaissance units, and intelligence, surveillance, and reconnaissance (ISR) capabilities, including use of UAVs, to support tactical and operational missions;
(9) Integrate electronic warfare (EW) into air defense ops;
(10) Improve cyber and EW defense in all units;
(11) Eliminate units and old equipment that do not support priorities above.

4. What kinds of missions and operations are the "new-type army" designed to carry out, and what does this mean for U.S. defense planners, and U.S. allies and partners in the region?

We can divide the PLAA's missions into those addressing traditional and non-traditional threats. Chief among the traditional campaigns remains reunification of Taiwan,[20] followed by mitigation of Korean peninsula emergencies, defense against Russian incursion (much reduced), deterrence and defeat of terrorism and internal unrest in Xinjiang, deterrence of religious extremism and internal unrest in Tibet, preventing spillover of unrest from Southeast Asia, and disaster response (which includes suppressing mass disturbances). Practically speaking, the United States and its allies can expect the presence of peer competitor Chinese ground forces in operations throughout East Asia, although major hostilities are less likely than smaller scale actions, sometimes of a cooperative nature.

Non-traditional threats include a wide range of other contingencies: sea lane protection, cyber warfare, space security, peacekeeping, humanitarian assistance/disaster relief (HA/DR) abroad, noncombatant evacuation operations, critical infrastructure and asset protection, and military diplomacy (a category which likely includes security cooperation and arms sales).[21] The PLA considers these to be non-combat military operations, many of which came to new prominence with the 2004 concept of "New Historic Missions." Thus defense planners should expect the presence of some Chinese forces with significant capabilities outside of East Asia as well.

[20] CMPR, 52.
[21] CMPR, 19.

The Chinese ground forces the U.S. and our allies and partners can expect to meet in the region will increasingly look like those described in the answer to question 3, above: stealthy, mobile, modular, and geared towards attacking targets at standoff distance. Make no mistake: PLAA's increasing lethality stands as both threat and deterrent to any nation challenging the extensive areas and domains over which China claims sovereignty. That said, in the near- to mid-term it is far more likely that China's neighbors will meet the PLAA in neutral or cooperative contexts. It is rather with PLAN and PLAAF that China's neighbors will have to contend at times, and in the cyber domain, where we are already at war.

5. How does the PLAA determine ground force modernization requirements and how are the requirements coordinated with the CMC?

In the simplest terms, PLAA (like the other services) has an Equipment Department charged with planning the Army's equipment development and coordinating it through the CMC Joint Equipment Development Department.[22] Prof. Tai Ming Cheung, America's chief scholar of the Chinese defense industry, describes the PLA's equipment development process as follows:[23]

> … the main approach the army would take in determining and formulating its modernization requirements… is through a weapons and equipment development strategy (WEDS) and associated weapons and equipment development plans. There is a PLA-level WEDS, which is tied to its Military Strategic Guidelines, and each of the service arms have their service-specific WEDS. These WEDS are long-term (10 year or longer) documents that provide the requirements, although actual projects and funding allocations are set out in implementation plans. There is discussion of WEDS and other planning and requirements mechanisms in various Chinese open source publications, but the actual WEDS is classified.

To understand some of the factors underlying China's view of equipment development, we can turn to China's National Defense University's *Theory of Military Development*, last published in 2008. At that time, the two areas of greatest innovation were informatization and mechanization.

It identified these trends: informatization (including intel and reconnaissance equipment, space-based networks like GPS, C4ISR systems, digitizing legacy systems, and data synthesis), accuracy improvement, stealth improvement, and the military development of space.

Development should be aimed at the demands of future war, in particular strengthening predictive research and debate on weapons and equipment and coordinating weapons and equipment development with economic development to increase efficiency.

The areas of emphasis should be early warning and detection, data collection (seamlessly integrated throughout the force), precision strike (through detecting, control, strike, and assessment phases), digital defense and denial, strategic force projection (especially at sea and in the air), and space control.

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[22] http://news.takungpao.com/mainland/focus/2016-01/3262548.html, accesed February 7, 2018).
[23] Email from Tai Ming Cheung to Ben Lowsen, February 8, 2018.

The underlying principle is to create breakthroughs in key areas. According to Jiang Zemin:

> To develop science and technology from a relatively backward material technological base, we must uphold the principle of doing some things and not doing others, developing critical science and technology which creates the greatest effect for the economy and national defense. This is advantageous for buying time, decrease the gap with developed countries, and as quickly as possible gaining for ourselves a leading position in a few key areas of emerging world-class high technology.

This appears to say that China accrues both prestige and advantage by being the first to make key breakthroughs as opposed to the plodding, unseen work of investing heavily to evolve current technologies. Can we count on the PLA ignoring the latter to advance the former, creating a cutting edge, high tech force that lacks the robustness created by long use? I would not count on it, although there is a clear tradition of incentives for "launching a sputnik," to use the Maoist term for a breakthrough.

China prizes the fusion of military and civil development, from which "the military finds sustenance in the people." The U.S. is known for spinning off military technologies into civilian projects after a time, and more recently for using commercial off-the-shelf technology in its operations. China's model seems to be a more contemporaneous fusion of civil and military science such that we see both the military stealing intellectual property for civilian profiteering and the state-capitalist sector transferring other properties for military use to erode U.S. advantages. Such equanimity with stolen property suggests a similar practice with homegrown varieties. The main part of the technological enterprise, military, civilian, private, and public, after all is under the tight control of the state.

China refers to this as "unified leadership." Deng Xiaoping in 1975 said "the equipping system must have a high level of consolidation, otherwise it becomes a 'junk stand,' unable to lay plans, unable to make war, unable to replenish munitions, and command is inconvenient."

Finally, "Realizing the 'New'" suggests the PLAA intends to emphasize stealthy, mobile, networked, "plug and play" forces for "system vs. system" warfare using the detect-direct-attack-assess model.[24]

6. What ground force defense acquisition programs also support national level antiaccess/area denial (A2/AD) capabilities?

In spite of aspirations to become a modern, hi-tech force, PLAA's traditional missions of Taiwan reunification and area defense still reign supreme, even as the emerging New Historic Missions gain in prominence. None of these missions call on PLAA to prevent or delay regional entry of another great power. These tasks go to PLARF, PLAAF, PLAN, and now PLASSF.

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[24] "建设强大现代化新型陆军，关键是实现一个"新"字 [Realizing the "New" is Key to Establishing a Strong, Modern New-Type Army]", *PLA Daily*, December 28, 2017.

That said, PLAA does possess a limited array of weaponry for use at somewhat longer standoff distances. Blasko lists this weaponry as:

(1) PHL03 Long-range rockets for coastal defense with a range of 150 km using advanced munitions;
(2) HQ-16 medium-range SAMs;
(3) Electronic warfare units can be integrated in coastal and air defense operations;
(4) Army Aviation brigades consisting of attack and transport helicopters can perform attack, transport, recon, EW, SAR, and medevac missions;
(5) UAV units perform ISR, possibly communications relay and EW, but not yet armed missions.

7. How has the military reform effort and the dismantling of the General Armaments Department affected the military modernization at the service level, particularly for the PLAA?

Blasko points out that the CMC EDD is "mainly responsible for development and planning, R&D, testing and authentication, procurement management and information system construction for the whole military's equipment." From this, he reasons that the traditional GAD responsibility for maintenance has devolved to the individual services. From this, I would speculate that the PLAA's Equipment Department will place much of its attention on maintaining its equipment, perhaps to the detriment of its role as the proponent for ground force equipment development. Considering the ethic of centralized technological planning mentioned above, any lack of Army involvement may be by design.

8. What recommendations do you have for Congress concerning the topic of your testimony?

To provide the Committee with what I believe is the clearest perspective on the reform, my testimony has emphasized the importance of Xi's efforts to establish the highest possible level of control over the military. Xi and most of China believe this form of loyalty will produce the most effective fighting force, both in terms of reliability and capability. Conversely, we in the West would see such strenuous efforts to ensure loyalty as a waste of time, stifler of innovation, and perhaps as an indicator of underlying weakness.

I would side with those who warn us not to dismiss PLA capabilities and hardware by assuming their "software" will cripple them. In most areas, the PLAA is the most significant competitor to U.S. ground forces. Although a direct ground conflict with China is less likely in the near term than clashes in the air, maritime, space, and cyber domains, we must remember that our ground forces' missions are quite different from China's. We in the United States keep our ground forces deployed abroad to a dizzying variety of missions ranging from combat, to civil governance support and HA/DR. China's ground forces are only beginning to dip their little toe into some of these missions as China's interests expand. The bottom line is that we need significant amounts of robust, high-quality capabilities. Moreover, the diffusion of technology through both legal and illegal means will ensure that even if we don't face China's forces directly, our land warriors must be prepared to defeat threats of comparable caliber if we are to succeed in the modern combat environment.

From a U.S. perspective, the U.S. Army's last posture statement (from 2016) looked to regain readiness lost under the strain of constant combat operations while seeking improvements in rotary wing aviation, network survivability, missile defense, combat vehicles, and cyber warfare.[25] This strategy seems aimed at producing an improved version of the current army, perhaps with a more diverse and balanced training regimen.

Army planners may rue the declining effectiveness of bombers and aircraft carriers, but how much longer will tanks and armored vehicles rule the battlefield? In the war of sensor-to-shooter, the bet is not much longer. Even with extremely limited modern technology, Iraqi insurgents were able to hold U.S. armored vehicles at risk. Our Army does not seem poised to leverage some of the most promising new technologies, although there are indications Army is beginning to perceive this deficiency.[26]

Most salient among the Army's – and our nation's – failures of perception is the cyber war in which we are currently engaged. Our failure to respond adequately to attacks against our networks and theft of intellectual property has blunted our Army's technological edge, mired our Defense Department's scientific enterprise, and is becoming a millstone around the neck of our innovation economy. It is imperative that we shine a bright light on this theft and empower our defenders to take serious action to shape hostile actors like China.

[25] *2016 Army Posture Statement*, U.S. Army.

[26] https://www.realcleardefense.com/2018/01/18/gen_milley_bets_on_lsquoradicalrsquo_tech_promises_no_more_fcs_299690.html