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Before the US-China Economic and Security Review Commission
China's Military Modernization and its Impact on the U.S. and the Asia-Pacific

March 29, 2007

Let me begin by expressing my appreciation to the Chairman and the other distinguished members of the US-China Economic and Security Review Commission. It is an honor to have the opportunity to testify here today.

My testimony will briefly examine three areas of concern:

- People's Liberation Army (PLA) intent and capability to conduct integrated joint military operations
- Improvements in PLA power projection capabilities; particularly as evidenced in the development of "blue water" and long-range, precision strike capabilities
- Increasing proficiency of PLA units to perform operational tasks specific to fighting a high-intensity, information-era war on China's periphery

Chinese National Power and Defense Modernization

The direction of the military component of Chinese national power is rooted in the strategic guidelines governing army building as promulgated by Jiang Zemin in 1993, and adjusted over the course of the last decade during subsequent five-year plans. Jiang's "Military Strategic Guidelines for the New Period" established the role and direction of China's military in responding to post-Cold War realities and the ascendance of the U.S. as the world's sole superpower. These guidelines also placed military developments in the context of a window of opportunity for China to increase its comprehensive national power (CNP), with particular focus on economic opportunity. Developing CNP is a quantitative endeavor for the Chinese, involving a wide variety of factors—encompassing tangible and intangible strength in political, economic, scientific, technological, military, cultural, and educational spheres. National development strategists must consider all elements of power, and resolve fundamental contradictions, in order for balanced development to occur. According to the *Chinese War Mobilization Encyclopedia*, CNP development focused on a "strategic objective" that represents the "basic national interest" will yield stability and growth. The "basic national interest" for China appears to be sustained economic growth with secure control of sovereign territory (from both internal and external threats)—under, of course, the guiding hand of the Chinese Communist Party.

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Based on these fundamental interests, Beijing's most recent White Paper on defense, *China's National Defense in 2006*, defines armed forces and armed police objectives as follows:

- Uphold national security and unity, and ensure the interests of national development
- Provide the source of strength for consolidating the rule of the Communist Party… and a solid security guarantee for sustaining this period of strategic opportunity for national development
- Guard against and resist aggression… defend against violation of China's territorial sea and air space, and borders
- Oppose and contain the separatist forces for Taiwan independence and their activities
- Take precautions against and crack down on terrorism, separatism and extremism in all forms

These objectives highlight the continuing importance of the military and armed police in protecting Party control—which requires capabilities to secure and defend border regions, provide air defense for key political and economic centers, and conduct domestic control and disaster relief operations. The PLA also derives offensive war fighting missions from these objectives, and directs force structure, campaign planning, and training programs accordingly. It is for these offensive missions that the PLA finds itself most in need of modernization and reform. The requirement to deter Taiwan from pursuing a path of permanent independence from the mainland is the central driver for the PLA's pursuit of offensive capabilities. For China's leaders, this includes a conventional capability to deter and delay the U.S. forces they believe will bolster Taiwan's defense in a conflict. Should deterrence fail, the PLA is expected to conduct one or a number of joint offensive campaigns in a Taiwan war zone, depending on the immediate strategic objective. Many of the campaign capabilities required to defeat Taiwan forces, control part or all of the island, and prevent the U.S. from denying China its strategic objectives, will also prepare the PLA to conduct a broader range of offensive operations in potential future regional contingencies.

One of the chief advances in analysis of PLA modernization over the past few years has been deeper access to and understanding of the Chinese doctrinal and strategic military lexicon. From a dissection of the now well-known text, *The Science of Military Strategy*, through more rigorous efforts by PLA watchers to mine a wealth of Chinese writings on doctrine, operational art, and defense programs, analysts have penetrated some of the dense shroud surrounding military modernization priorities, focus and intent. The emerging picture is of a PLA determined to use the current peaceful environment in East Asia to build and train a force capable of fighting and winning a high-intensity, information-era war in the region against a technologically advanced adversary—and to minimize the vulnerability of the political and economic centers along China's eastern seaboard in such a conflict.

According to the 2006 Defense White Paper, the PLA's modernization drive is unfolding in three steps. The first step is to establish a "solid foundation" for a modernized force by

2010. Step two is to make "major progress" by 2020. The ultimate goal, to be realized by mid-century, is to field a force capable of winning "informationized wars." The war fighting core of the PLA will be equipped, task-organized and trained to conduct joint offensive campaigns—such as the joint island landing campaign, the joint firepower campaign, and the joint blockade campaign—requiring regional air superiority, sea control, and information dominance capabilities. China's defense programs appear on track to deploy and integrate over the next decade the key components needed to conduct these campaigns as doctrinally designed—such as joint command and control systems, long-range surveillance and reconnaissance assets, precision over-the-horizon strike systems, maritime area air defenses, and a real-time, joint targeting architecture.

"Informationized Warfare"

"Informationization" at the operational level appears focused on providing an integrated platform for joint war zone command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) connectivity. According to official Chinese media, the 11th Five-Year Plan tasks the PLA Informationization Work Office to move the PLA toward a "perfect universal transmission…and processing platform." Recent programs to establish integrated joint communications and data transfer capabilities attest to the priority placed on this effort, and China's information technology sector is certainly capable of providing an effective architecture commensurate with the high level of resource commitment.

One of the primary tasks of conducting "informationized warfare" is to transform traditional modes of mobilization to fit the conditions of modern warfare—the concept of "people's war" in a new era. For this reason, the modernization and reorganization of militia and reserve forces is to great extent focused on bringing in high-technology qualified reservists and militia members—both to form new high-tech units (such as information and electronic warfare detachments), and to leaven existing or transforming units with more capable engineers and computer technicians. According to a recent *PLA Daily* article, "specialized technical detachments" comprise 41% of reserve units; and the PLA has introduced a number of new reserve units responsible for communications and electronic warfare missions. The urban militia is evolving to provide the war fighting force with high-tech support, providing access to an increasingly tech-savvy workforce.

Putting the Pieces Together… Integrated Joint Campaign Operations

This Commission has over the past few years been briefed on the many foreign-acquired and indigenous missile, naval, and airborne systems that could potentially place at risk U.S. forces responding to a crisis in the Taiwan Strait. But the systems in isolation do not equate to a capability for sustained combat on a modern, multi-dimensional battlefield. "Integrated joint operations" is the current PLA buzz-phrase for training, equipping, and sustaining the force to conduct multi-service operations in an "informationized" environment. While definitions of joint operations differ between Chinese strategists and their American counterparts, integrated joint operations specifically refer to multi-service campaigns controlled by a joint headquarters with an integrated command and control

(C2) architecture. Analysts are unsure of the status of this architecture, but PLA and Military Region periodicals run numerous articles referring to tests and experiments involving its components. An integrated architecture would overcome a major obstacle to joint C2 and could potentially fuse data from intelligence, surveillance, and reconnaissance (ISR) assets into a near-real time "sensor-to-shooter" targeting network. As joint C4ISR and targeting systems and processes mature over the next decade, the PLA will be able to bring to bear the modern weapon systems afforded by increased defense spending and ongoing research, development, and acquisition programs. These systems and programs potentially allow the PLA to conduct the operations that underpin the PLA's joint offensive campaigns—to include over-the-horizon precision strikes against land and maritime targets; kinetic and non-kinetic counter-C4ISR attacks; air superiority operations; and airborne and airmobile operations.

First Things First: The Information Fight. Chinese doctrinal writings emphasize that the success of any campaign hinges largely on the ability to establish and maintain information dominance. This involves deploying and protecting a robust C4ISR capability in the theater of operations, and denying the enemy the use of the electro-magnetic spectrum to command forces and gain information. As previously noted, the PLA has prioritized programs to provide an integrated, joint C4ISR platform that will fuse data from multiple sources. This platform will use both space and terrestrial systems to locate, classify, track, and target enemy forces, and to command and control PLA forces in a variety of frequency bands.

Over-the-horizon detection and targeting are a significant capability shortfall for the PLA, but will improve greatly as new space-based sensors, long distance air reconnaissance drones, and airborne early warning platforms deploy over the next few years. While data link, data relay, and data fusion program details are obviously shrouded in secrecy, it seems likely that systems linking and fusing data between space, air, and terrestrial systems will be available to combat commanders across the force in five to ten years. The key space system required by Beijing to achieve a more integrated architecture is a satellite data relay platform—a system that analysts of PLA space programs believe could be in orbit within three to five years. China also has programs to develop small satellite systems for rapid launch in a contingency, to provide augmentation for communications and intelligence networks.

Over the past decade, the PLA has placed a great deal of emphasis on developing airborne warning and control systems (AWACS). The PLA Air Force (PLAAF) MAINSTAY system, based on the Russian A-50 aircraft, now provides airborne warning and control with phased-array radar and data link capability. China's indigenous Y-8 turboprop aircraft also has an airborne early warning/C2 variant. With compatible data link systems on fighter aircraft, ship-borne helicopters, and surface ships, these airborne assets will greatly improve PLA ISR and targeting operations offshore—out to approximately 400 nautical miles from China's coast, and within range of potential operating areas for U.S. carriers in a Taiwan crisis response scenario. Reportedly, all PLA Navy (PLAN) destroyers are able to data link with AWACS aircraft, each other, on-board helicopters, and their anti-ship cruise missiles. The extent to which Chinese

surface combatants are able to employ these capabilities is unknown—but PLAN publications indicate that naval exercises reflect PLA guidance to prioritize systems integration training.

In order to degrade the C4ISR capabilities of a technologically sophisticated adversary, PLA strategists are developing the doctrine and fielding the systems to conduct "integrated network electronic warfare." This concept borrows from U.S. theories of net-centric warfare, but is focused more specifically on establishing the conditions to paralyze a technology-dependent adversary and rapidly seize strategic objectives. The components of network electronic warfare include terrestrial and airborne jammers, to include GPS jamming systems; anti-radiation missiles and unmanned aerial vehicles (UAV) such as the Israeli HARPY; laser and directed-energy systems; direct ascent anti-satellite (ASAT) weapons; and computer network attack capabilities. These assets potentially improve the PLA's ability to jam or spoof precision-guided munitions, degrade or destroy air defense radars, and disrupt communication and intelligence networks.

China can already track most satellites with sufficient accuracy for targeting purposes, and has programs to disrupt or destroy overhead sensors. The recent successful test of a Chinese direct-ascent, kinetic kill anti-satellite vehicle illustrates that Beijing has the wherewithal to hold critical U.S. C4ISR assets at risk. China is investing in high energy lasers for a variety of missions including air defense, ASAT operations, and theater missile defense. Radiofrequency weapons, such as a conventional electro-magnetic pulse warhead, would enhance an anti-access strategy designed to slow and confuse a force responding to a regional crisis. Although some of these capabilities are many years from weaponization, the PLA is poising to wage increasingly sophisticated information warfare on a broad scale.

Improving Air and Maritime Power Projection Capabilities. For the campaigns that the PLA expects to wage in the western Pacific, establishing a favorable information environment is the first step toward gaining air and maritime superiority at key times and places. There are two overarching components in PLA efforts to realize the broader air defense, offensive counter-air, and maritime strike capabilities required for joint blockade, anti-access, and island invasion campaigns. The first is the formation of elite configurations of air and maritime packages to conduct regional air superiority, sea denial, and sea control operations. The second is a long-range precision strike strategy, represented by a large array of cruise and ballistic missiles supported by a variety of sensors. The objective of this strategy is to bring together network electronic warfare, space-based and airborne ISR, and advanced missile systems to provide the capability to strike bases on Taiwan, forward U.S. bases in the region, and naval formations at sea.

China's navy is focused on fielding modern destroyers, submarines, cruise missiles, and maritime strike aircraft to deter or prevent an adversary from operating for a given period of time in or above a critical sea lane or maritime zone of maneuver. Even confronting a modern naval foe, China likely can control for long periods of time the waters covered by its land-based air defenses. The PLAN also has the systems to credibly conduct short-

term sea denial operations out to about 400 nautical miles from its eastern and southern coastlines—by 2010, with more robust maritime area air defenses, the PLAN may be able to sustain such operations for a few weeks. Obviously, this capability does not accrue to the Straits of Malacca and the Indian Ocean—China can at best hope to "show the flag" for coercive and/or defensive purposes in those waters until after 2015. Nor would it apply to the blue water of the Western Pacific, particularly if opposed by U.S. or allied naval forces.

China's submarine force is the key component in Beijing's sea denial strategy, and for future extended sea control aspirations. Beijing is concurrently building four classes of submarines, and acquiring another from Russia. China commissioned approximately 17 submarines in the last two years. The PLAN has about 28 modern submarines in the fleet, in addition to a similar number of older boats that continue to require the attention of American commanders in the Pacific theater. The backbone of the modern diesel attack fleet is the Russian KILO class, of which Beijing will have 10 in the fleet by the end of this year. Because China has access to the entire family of Russian CLUB missiles, the new KILO submarines that began arriving in 2005 could have the 300km-range 3M-14 land attack cruise missile (LACM), the 220km-range 3M-54E anti-ship cruise missile (ASCM), and the 91RE1 rocket. This is an extremely lethal weapons suite that allows the KILO to support a number of PLA campaign requirements.

China's new indigenously produced nuclear attack submarine, the SHANG class, benefits greatly from Russian technology and design—it will be armed with both ASCMs and LACMs. The SHANG's range and weaponry will give the PLA its first non-nuclear global strike capability—the PLA may have more than 10 SHANGs operational by the end of next year. The new indigenously produced YUAN class diesel boat may include air-independent propulsion systems that will increase the submerged endurance of the platform. China's older MING and ROMEO submarines remain in service, and likely will continue to do so for some years. They can serve as mine-laying platforms, and can be used to complicate the anti-submarine warfare (ASW) picture.

The second component of Beijing's sea denial strategy is the upgraded destroyer and frigate fleet (about 21 destroyers and 43 frigates). Beijing has purchased four Russian SOVREMENNY destroyers, and is building eight new classes of indigenous destroyers and frigates. China has around nine modern destroyers in service, with greatly improved anti-air and anti-ship missile systems. The LUHAI and LUYANG destroyers are designed to ameliorate the PLAN's most glaring maritime power projection shortfall—ship-borne area air defenses. Of particular note is the LUYANG II class destroyer, which has the vertical-launch HQ-9 area air defense system, with phased-array radar somewhat similar to that of the U.S. AEGIS system. The LUHAI and LUYANG also will have the capability to conduct long-range anti-surface warfare (ASuW) missions with supersonic ASCMs.

Beijing has 17 modern frigates in service, incorporating much-improved air defenses. The JIANGKAI class is noteworthy, as it has a stealthy design similar to the French LAFAYETTE class. China has also introduced a new fast-attack missile platform with a

stealthy, catamaran hull design; and is investing in a deep-water mining capability, with a wide variety of applications via varied delivery and activation mechanisms, to include acoustically activated, remote control technology.

To shift from sea denial to sea control operations further from its coastline, China will need to realize success in its aircraft carrier program, increase production of nuclear attack submarines, and integrate space-based and terrestrial command, control, and intelligence architectures. The Chinese do not appear to be pursuing a transition to a carrier navy; but this does not rule out the possibility of a "hybrid" navy that has one or two carrier groups designed to provide minimum blue-water power projection for regional contingencies. Some observers believe that China will indigenously build a 45,000-60,000-ton carrier that could carry 30-40 SU30MKK multi-role fighters—something that the PLAN could probably achieve around 2015.

Command and control, at-sea replenishment, and ASW remain capability shortfalls that plague PLAN efforts to extend its reach. Even for "green water" operations, the PLAN has yet to achieve full integration and automation of fleet command and control systems. The Chinese acquisition of the French TAVITAC system, which is very similar to the U.S. Navy's Link 11 secure tactical data system, will probably allow China to address this shortfall by 2010. To fill the at-sea replenishment gap, two new DAYUN class supply ships are entering service. The Chinese do not appear to have given a high priority to ASW improvements. Some of their Russian acquisitions, both surface and submarine, have included advanced ASW weapons; but Chinese maritime formations likely will remain highly vulnerable to enemy submarines for at least the next decade.

The PLAAF has both defensive and offensive mandates in support of integrated joint campaign operations. With advanced, layered, and increasingly integrated land-based air defenses, the PLAAF has greatly improved capabilities to conduct its traditional defensive mission, the strategic air defense campaign. The SA10/20 surface-to-air missile (SAM) systems acquired from Russia provide the heart of these defenses, with powerful radar capabilities and high-performance missiles that can range in excess of 100 nautical miles. Extended range missiles are available from Russia and will probably be fielded soon—giving the PLAAF the ability to cover the island of Taiwan from deployment locations near the Chinese coast. The growing, modern PLAAF and PLAN Air Force (PLANAF) indigenous and Russian-produced fighter fleet is capable of supporting the air defense campaign, but is not yet prepared to sustain even regional air superiority operations against a modern adversary.

The PLAAF, however, aspires in the near future to develop capabilities to conduct the offensive air campaign required to gain air superiority over the Taiwan Strait, support ground forces if deployed in the region, and support sea denial and control operations in adjacent seas. The SU-30 multi-role and maritime strike aircraft and newer, longer range strategic SAM systems purchased from Russia provide the capability to conduct temporary offensive operations out to at least 200 KM from China's land and sea borders—and perhaps beyond when sea-based air defenses become more capable over the next five years. The stand-off capabilities of the PLANAF's SU-30MKK2 maritime

strike fleet would also benefit if Russia sells Beijing the new 300km-range Kh-59MK ASCM. We have previously discussed Beijing's deployment of airborne early warning systems—the PLAAF also has made progress in aerial refueling and improved targeting capabilities via UAVs, ship-borne helicopters, and over-the-horizon radars. These systems are probably not yet integrated with each other and with space-based detection and tracking systems, but current programs could shore up this weakness within five years. Beijing is purchasing IL-78 refueling tankers, which will refuel the Russian SU-30 aircraft in both PLAAF and PLANAF inventories—giving them reach out into the Sea of Japan, the South China Sea, and to Guam.

The 2nd Artillery: Missile Forces Modernize for Joint Offensive Campaigns. The conventional arm of China's strategic rocket force, the 2nd Artillery, is probably the best-trained and most ready service arm within the PLA; and serves a critical role in Beijing's approach to several key joint campaigns, including the joint island landing and joint blockade campaigns. These forces are not focused on deterrent or retaliatory missions—by doctrine and training they are focused on seizing the initiative in offensive operations. PLA writings stress that conventional missiles forces are most effective in preemptive strikes against high value targets.

The rapid growth of the CSS-6 and CSS-7 short-range ballistic missile (SRBM) force, and qualitative improvements in missile technology over the past ten years, yield a force of approximately 850 missiles providing a precision strike capability. Terminal homing technology and satellite-assisted navigation (using GPS, Russian GLONASS and indigenous Bei Dou satellite navigation systems) make these missiles highly accurate. While the SRBM force serves primarily to address a potential Taiwan conflict, developments in the conventional medium-range and intermediate-range (MRBM/IRBM) realm pose the possibility of holding at risk all U.S. forward bases in the Western Pacific. These missiles, in conjunction with long-range cruise missiles launched from air platforms, provide stand-off capabilities out to Guam.

China's program to develop an anti-ship ballistic missile (ASBM) capability is of greatest concern to U.S. naval forces operating in the Western Pacific. This future ASBM system would be an integral part of a reconnaissance-strike complex able to target naval forces at sea at unprecedented ranges. Chinese writings recognize this as a watershed capability with the potential to change the regional strategic balance. As the Chinese seek to transition from sea denial to sea control operations further from the Chinese coast, an ASBM capability could prove decisive. U.S. carrier groups responding to a Taiwan crisis may have to operate much further from China's coast to avoid unacceptable risk—ensuring air superiority over the Strait will increasingly involve difficult decisions about the extent to which the U.S. is willing to strike targets on the Chinese mainland. An ASBM capability will be extremely difficult to realize, involving a complex "system of systems" including: C2 infrastructures; space and surface over-the-horizon reconnaissance and targeting systems; real-time targeting data fusion; seeker systems able to track, target, and engage naval platforms at great range; long-range missile systems; advanced maneuverable warhead technology; and a science, technology and industrial sector capable of supporting these systems and technologies. The Chinese, however,

appear focused on integrating a mobile, maneuverable re-entry (MaRV) ASBM with a C4ISR architecture increasingly capable of geo-locating targets at sea. If successful, this capability would enhance sea denial operations as much as 1,000 miles from China's eastern seaboard, and facilitate the PLA navy's burgeoning drive to control waters within 300-400 miles of the coast.

Regarding the nuclear arm of the 2nd Artillery strategic rocket force, Beijing appears to view modernization as a means to strengthen its traditional role—as a tool to deter nuclear aggression and prevent more powerful states from using strategic capabilities to politically blackmail Beijing. The "nuclear counter-strike campaign" remains the only stated operational mission for the force. While the nuclear force is expected to grow over the next decade, and mobile, solid-fueled missiles will replace older, less survivable systems, there seems to be little indication that China's fundamental nuclear posture is changing to encompass broader nuclear-warfighting constructs. It will be absolutely critical, however, for analysts to closely watch for indications of nuclear armed air- and ground-launched cruise missiles—a development that would have obvious implications for regional stability, strategic deterrence, and escalation control.

To improve the deterrent impact of Beijing's strategy, the PLAN is also modernizing the sea-based nuclear force. China's navy is a strategic force in name only at the moment, but this is changing. A new SSBN, the Type 094 class, should enter service within the next three years. Analysts expect it to be armed with 12 JL-2 ballistic missiles, which could have a range of as much as 12,000km. This would permit attacks on most continental U.S. targets from protected locations close to China's shore.

Ground Forces: The Forgotten Service? As Beijing seeks to rapidly develop niche capabilities to deter Taiwan independence activities, China's ground forces have taken a backseat in resource prioritization to air, naval and missile forces. A significant portion of the ground force remains committed to border, garrison, and key point defense, and to providing the visible extension of Communist Party power throughout the country. Approximately a third of the force, however, constitutes an increasingly professional war fighting core. Understanding the requirement to build an amphibious and air transportable force capable of responding to a call to arms in the Taiwan Strait—and also to have a heavy mobile warfare force for contingency use in Central Asia, the Korean Peninsula, or the Russian Far East—PLA force planners have clearly begun to restructure, equip, and train units for specific offensive missions. The 2006 National Defense White Paper states that, "the Army aims at moving from regional defense to trans-regional mobility, and improving its capabilities in air-ground integrated operations, long-distance maneuvers, rapid assaults and special operations."

Over the course of the past decade, the PLA built at least four major amphibious training bases, and about one quarter of the PLA's maneuver divisions and brigades focused on training for amphibious operations. The special operations and airmobile capabilities needed in support of missile and air strikes against Taiwan are also priorities for ground force development initiatives. Downsizing or retiring a number of old divisions in favor of modernized, task-organized brigades possibly improves the PLA's capability to

respond to potential crises along the full length of China's northern border and tailors some units to more effectively conduct amphibious operations against Taiwan or Taiwan-controlled islands in the Strait.

Recent developments in the helicopter force indicate that the General Staff is well aware of the need for air assault capabilities to address shortfalls in contingency mission areas, such as a landing campaign against Taiwan or a mechanized campaign on the Korean border, in Siberia, or along China's Central Asian periphery. The force remains small and focused on limited transport capabilities, but the PLA has a coherent, focused plan for transitioning the force to deliver the firepower needed for air assault missions. Strategic lift in the PLAAF is a constraint on airborne power projection at the moment, but Beijing has inked a deal to purchase additional IL-76 transport aircraft, which could increase lift capacity for airborne forces by as much as 150 percent.

Training and Logistics: Making Integrated Joint Operations a Reality

The PLA officer and fledgling NCO corps are largely combat inexperienced—veterans of the Vietnam incursion of 1979 are for the most part gone, and the PLA at the unit level is no longer their army. As such, the ability of the PLA to integrate new weapons systems, perform new missions, and develop the logistics structure to sustain high-intensity combat will largely determine whether or not PLA forces can put joint offensive campaigns into operation under complex information-era conditions.

Logistics is a key area of concern in integrated joint operations—legacy logistics support for the PLA is "stove-piped" by service, slow, and inefficient. However, an automated "tri-service logistic interaction platform" was reportedly introduced recently in a sub-department of the Beijing Military Region (following a similar fielding in the Jinan region). Of particular interest is the fact that the report indicated that the platform was introduced to provide joint logistic support to the "Beijing Theater of Operation," rather than to the Beijing Military Region—stressing the wartime mission.

In the aftermath of the recent session of China's National People's Congress, Chinese media analysis of PLA plenary sessions heavily stressed the importance placed by PLA leadership on training to fight "informationized" war—with emphasis on weapons system integration, joint C2 and command post procedures and architectures, and electronic warfare capabilities. Most reports on exercise activity do not indicate that PLA units are attempting large-scale joint scenarios. They do paint a picture, however, of a force that is exercising the discrete elements required of certain offensive campaigns; and they indicate that higher-level joint C2 processes are being exercised via simulations and command post training. Of particular note, Chinese open sources have been more openly critical of training shortfalls, and the fixes required—indicating that the PLA is serious about training evaluation procedures and corrective action. The effectiveness of PLA training over the next five years—in terms of new weapons integration, joint C2, and joint firepower operations—will determine the extent to which the force is meeting Beijing's stated modernization goals.