中国简报 China Brief
a journal of analysis and information
The JAMESTOWN FOUNDATION

VOLUME XIV • ISSUE 14 • JULY 17, 2014

In This Issue:

Xi met India's new prime minister at a BRICS summit and said that China and India are both seeking "national renewal" (Source: Deccan Chronicle)

China Brief is a bi-weekly journal of information and analysis covering Greater China in Eurasia.

China Brief is a publication of The Jamestown Foundation, a private non-profit organization based in Washington D.C. and is edited by David Cohen.

For comments and questions about China Brief, please contact us at
< cohen@jamestown.org >

1111 16th St. NW, Suite 320
Washington, DC 20036

Tel: 202.483.8888
Fax: 202.483.8337

In a Fortnight

XI WOOS MODI WITH 'PEACE THROUGH DEVELOPMENT' APPROACH

By David Cohen

On July 14, Chinese President Xi Jinping became the second national leader to meet newly elected Indian Prime Minister Narendra Modi (who has paid a state visit to Bhutan), beating Japanese Prime Minister Shinzo Abe in an 80-minute face-to-face meeting at the BRICS Summit in Fortaleza, Brazil (qstheory.cn, July 16). The message he delivered, focusing on China and India's shared development ambitions, is an application of a theory of development-led diplomacy that Chinese leaders have put forth over the past year.

Xi's meeting edges out Abe, who had earlier been promised Modi's first overseas trip. While Modi may still make Japan his first state visit outside the Indian subcontinent, he has delayed a trip planned for early July to September (*The Hindu*, July 14). In the meantime, with the Xi meeting and a previous visit by Wang Yi, China has been making a pitch to India for a closer relationship built upon expanding economic cooperation—with two new banks to support Indian infrastructure and hints of a trade in services deal, which could help to rebalance India's $31 billion trade deficit with China (*Times of India*, June 8). China currently puts strict limits on trade in services, an area in which India has an advantage.

Both Xi and Wang have drawn upon an approach to regional foreign policy first

expounded at last year's Work Forum on Peripheral Diplomacy, and since elaborated in Xi's speech at the Conference on Interaction and Confidence Building in Asia. This approach seeks to persuade China's neighbors that "for Asians, development is the greatest form of security"—promoting a conception of security that privileges development above other concerns and allows China to argue that its own economic growth is a major contribution to regional security (see *China Brief*, May 23 and June 19). The goal of this approach seems to be to ensure that economic integration outweighs territorial disputes in the strategic calculus of China's neighbors.

India's new government, as Jonathan Ward wrote in *China Brief* last month, presents China with a test of this theory: Modi harshly criticized China's territorial claims on the campaign trail, accusing it of having an "expansionist mindset," but has also made economic development a centerpiece of his government and evinced an interest in learning from China's reform process (see *China Brief*, June 19). Both Xi and Wang have seized on the latter focus to argue that the two countries are united by their status as developing nations, and have sought to address Indian economic concerns.

At their meeting, Xi said that both countries are currently "striving for national rejuvenation," and called for increased services trade, investment and tourism, noting that trade must be balanced to be sustainable—an observation happily endorsed by India's foreign ministry spokesman (qstheory.cn, July 16; Indian Ministry of External Affairs press briefing, July 15). Wang likewise emphasized shared dreams of national renewal (PRC Foreign Ministry, June 9). Both mentioned the territorial disputes, but did not offer anything new—relegating the issue to the end of their speeches and saying that existing frameworks are sufficient to manage the dispute.

China has also deployed international organizations to woo India, inviting it to join the Asian Infrastructure Investment Bank, proposed last year, which will further economic ties both by direct investment and by facilitating further trade in physical goods (qstheory.cn, July 16). A deal announced at the summit to create a BRICS development bank headquartered in Shanghai and initially led by an Indian President will help with the same goals (*Times of India*, July 16). Xi also invited Modi to attend a November APEC summit hosted by China, which will be India's first appearance at that forum, and reportedly told Modi that he "looks forward to working more closely with India at the Shanghai Cooperation Forum," a China-initiated organization at which India has been denied full membership (Indian Ministry of External Affairs press briefing, July 15).

But Modi is also clearly concerned about traditional security issues, focusing on them in a statement released at the opening of the BRICS summit. He mentioned terrorism, Afghanistan, the current wars in the Middle East and North Africa and cyber-security, but not territorial disputes (NDTV, July 15). Likewise, he is apparently interested in maintaining a close relationship with Abe despite the growing tensions in Sino-Japanese ties.

China is unlikely to shelve its territorial disputes in pursuit of trade—while rolling out the peripheral diplomacy strategy in Southeast Asia, China has not avoided confrontations in the South China Sea, placing an oil rig in Vietnamese-claimed waters and sending navy ships to visit a reef in waters disputed with Malaysia during an exercise in February. The oil rig ended drilling on July 15, somewhat earlier than the originally stated schedule of drilling into the middle of August. Instead, Xi argues that the benefits of development will simply outweigh other types of security.

But this theory may work both ways: Xi has argued that it is possible to decouple economic cooperation from territorial and strategic confrontation. While he has made progress toward forging a close business relationship with Modi, there is no guarantee that it will translate into politics.

David Cohen is the editor of China Brief.

*

BREAKING WESTERN MONOPOLIES: CHINESE MILITARY INNOVATION BEARING FRUIT

By Duncan Rogers

On July 10, several Chinese news outlets announced that China had taken an important step towards achieving "self-reliance" (*zizhu baozhang*) through the "breaking" (*dapo*) of a foreign monopoly on military-use computer airborne systems (People's Daily Online, July 10). Many details of the two real-time operating systems (RTOS) have yet to be released, yet their implications for China's national military industrial complex are nonetheless important, given it has long been criticized for its limited progress in indigenous innovation resulting from an over-reliance on foreign importation of technology and knowledge.

Details of RTOS

According the press release, the two RTOS are reported to maintain a high degree of "reliability" (*gao kekao xing*) and "security" (*gao anquan xing*), outperforming foreign equivalents when put through testing conducted by the Committee for the Finalization of Military Aviation Products. Cross referenced with details from the website the developer, Coretek, a subsidiary of the China Aviation industry Corporation (AVIC), both RTOS are assumed to comply with DO-178B guidance, an internationally recognized standard determining the reliability of software when used in conjunction with specific airborne equipment, including both commercial and military aircraft (Coretek, July 8). It has yet to be established which military aircraft have been the primary targets in the development of the two systems. However, China's military defense system is reported already to have adopted the new RTOS, carrying important implications not only for the future of its combat capable force (currently estimated at 2,193: IISS *Military Balance 2014*, p. 236), but also for international export markets, where China is becoming an increasingly important player. China has, up to this point, lacked the capability to produce operating systems rivaling those developed by companies such as IRKUT (Russia) and Green Hills Software (USA), who have respectively developed RTOS for fighter models as the Su-30 and F/A-22. Moreover, while national research and development in China's military industry remain primarily focused on support of the PLA and its procurement needs, it has already established niche export markets with some Asian and African countries with considerable prospects for growth, particularly if it can compete with Russian dominance in engine production.

Implications for Innovation in China's Military Industrial Complex

Over the last sixty years, China has produced few truly "indigenous" innovations. Foreign acquisition, reverse engineering, coproduction and theft have proved more reliable ways to quickly close perceived strategic gaps. Even China's more recent aircraft models such as the J-10B, which is promoted nationally for its indigenously developed engine (the WS-10A), required Israeli assistance for the design of its weapons systems and delivery platforms. Similarly, parts of the design of China's much-anticipated fifth-generation fighter, the Chengdu J-20, are believed to have been stolen from the Lockheed Martin F-35 Lightning II platform via a cyber espionage campaign dubbed "Operation Byzantine Hades" by U.S. intelligence agencies (*Wall Street Journal*, April 21, 2009).

Cyber campaigns and reverse engineering offer a cost-effective means for fast development of modern technologies, particularly given the range of problems with domestic innovation efforts frequently cited by external observers: "inefficiency, redundant leadership and overlapping organization and bureaucratic structures" over the last two decades (*The Chinese Air Force: Evolving Concepts, Roles, and Capabilities* [2012], p. 257). However, the emphasis on foreign acquisition does not necessarily obstruct domestic innovation, and the latest development in avionics is likely to be part of a larger qualitative shift in Chinese indigenous production. China has undertaken a major overhaul of its entire military industrial base over the past 20 years, the results of which have been a quantum shift in quality production, approaching world-class standards in a multitude of arenas.

Beginning in the early 1990s China first restructured its defense industry base into large state owned enterprises, such as the China Aviation Industry Corporation (CAIC), with the aim to increase productivity under corporate structures. Since then, several phases of reorganization have seen the formation of 11 national level military-industrial groups, now under the administration

China's State Administration of Science, Technology, and Industrial for National Defense (SASTIND) with increasingly commercially-sourced funds that has allowed for Chinese firms to undertake increasingly risky research projects that were thwarted under previous industry management structures and boosted domestic competition. Finally, cross-over between China's civilian and military sectors, championed under the 2006–2020 MLT Science and Technology Development Plan and reinforced by Chinese leadership (for example during Hu Jintao's speech at the 17th Party Congress) has allowed military industrial enterprises to take large strides in collaborative research and development (China.org.cn, October 15, 2007).

Military-use aviation technologies do not frequently transfer to civilian arenas, meaning that compartmentalization of technologies continues to pose issues for certain military development areas. However, the long-term goal of China's military technology base continues to be self-reliance, as lessons from its 1960s split with the Soviet Union, has shown that over-reliance on foreign technology leaves China strategically weak. The split forced China to develop its reverse-engineering capabilities, but at a considerable time cost. It was only later during the latter part of the 1970s that China was able to source advanced technology from other countries such as Britain and France through broadening its diplomatic engagement.

Furthermore, modern export restrictions (most notably from the EU and United States), in place since 1989, continue to act as a significant hindrance to China's ability to co-produce or procure modern technologies from Western nations. Industrial espionage has yet to cause wide-spread consequences for China in terms of international commercial engagement, with Germany and the UK both recently signing further trade agreements worth tens of billions of dollars on the back of the visits by Chinese Premier Li Keqiang (*China Daily*, June 20). Moreover, as the strategic gap in capabilities narrows, Chinese enterprises will be increasingly pushed towards innovation rather than imitation in order to gain competitive advantages not only in a strategic sense, but also in the economic arena.

In aviation fields, significant hurdles will need to be overcome before China can realize its core goal to become a global strategic power, most notably its difficulties in producing a turbo-fan engine. Key Russian and Western analysts still assume the PLAAF is 15–20 years behind the world's leading air-powers. The former Chinese president, Hu Jintao originally tasked Chinese military technology developers with "blazing a path of development of integrating civilian and military spheres" (*zou chu yi tiao zhongguo tese junmin ronghe shi fazhan luzi*), the gap may be closing significantly through established methods of imitation, coproduction and theft, but as this occurs it can be expected that indigenous innovation increasingly features as a component of Chinese procurement strategy (*Report to the Seventeenth National Congress of the Communist Party of China*, October 15, 2007).

Duncan Rogers is a graduate of King's College London and currently works for the International Affairs Department of Royal United Services Institute. He has over 5 years experience working in China in diplomatic and commercial roles. The views expressed here are his own.

***

China Seeks to Strengthen Mongolian Trade Links During August Trilateral Summit

By Alicia Campi

This year Sino-Mongolian relations have been buffeted by a series of challenging interruptions: the Mongolian government's standoff with Rio Tinto over expanding underground mining operations at Oyu Tolgoi (OT) which will disrupt development of shipments of copper concentrate supplies to China, another Mongolian postponement in the repayment of $130 million worth of coal owed by Mongolia's state-owned Erdenes Tavan Tolgoi JSC since 2011 to Chalco (China Aluminum International Trading Co., Ltd), and the news that the former chairman of Mongolia's Petroleum Authority, Djashzeveg Amarsaikhan, who was a suspect in a money laundering conspiracy with Petro China Daqing Tamsag, suddenly died in prison ("Transparent Mining" press conference of April 30, 2014 reported by mad-intelligence.com, May 2, 2014; english.news.mn, May 14, 2014). Nonetheless, the Chinese have not allowed such factors to negatively impact the relationship during the

China-Mongolia Friendship and Exchange Year.

This spring saw a spate of high-level Sino-Mongolian meetings in China which now appear to be steps that have led to a new wave of economic cooperation agreements. In late April, Chinese Vice President Li Yuanchao hosted a delegation from the opposition Mongolian People's Party and stated that "the Communist Party of China (CPC) and the Chinese government always deal with China-Mongolia ties strategically and with a long-term perspective" (Global Times, english.news.mn, April 26). On May 19 in Shanghai, Mongolian President Tsakhia Elbegdorj had met Xi prior to the Fourth Conference on Interaction and Confidence Building Measures in Asia (CICA) to discuss mining, infrastructure and financial cooperation. At that time Xi promised to support Mongolia's bid to enter APEC and emphasized China's desire to strengthen bilateral energy and mineral development (*The Mongol Messenger*, May 23).

China's Silk Road Economic Belt and Asian Infrastructure Investment Bank initiatives have also contributed to newly concluded agreements governing transport, finance, and construction cooperation concluded as part of the celebrations marking the 65th anniversary of the establishment of bilateral diplomatic relations and the 20th anniversary of the Treaty on Friendly Relations and Cooperation. Chinese President Xi Jinping has agreed to make a state visit to Mongolia in the latter part of August, at the same time as Russia's Vladimir Putin is in Mongolia to celebrate the 75th anniversary of the Soviet-Mongolian victory over the Japanese at Khalkhin Gol. Mongolian officials proudly labeled this a "Trilateral Summit" (announced at Ulaanbaatar Dialogue on Northeast Asian Security meeting, June 17). PRC Minister of Foreign Affairs, Wang Yi, then paid an official visit to Mongolia on June 24–26 to complete trip logistics (Mongolian Ministry of Foreign Affairs, www.mfa.gov.mn, June 25).

Coal continues to dominate Sino-Mongolian trade relations, despite the steep decline in coal prices on the world market. Mongolian coal exports to China from April 2013 to March 2014 grew 8.4 percent by volume, although their value fell by 1 percent, according to Mongolia's National Statistical Office. Agreement to export another 450,000 tons of coal to China was concluded between Mongolia and China's Shenhua Bayannaoer Energy Co. on April 17, 2014. Price per ton of coal was set at $48.50, with the stipulation that $17.4 million or 80 percent of the total estimated $21.8 million should first be transferred into Mongolia's account (infomongolia, May 2). However, the greatest potential growth for Sino-Mongolian trade will be in copper as the country moves toward a "copper economy" (Mongolian Investment Banking Group, "Economy—Mongolia Transitions into a Copper Economy," carried in mad-investment.com, May 5). Mongolia's copper concentrate export volumes increased 53 percent during the 2013–2014 period, which accounted for 35 percent of total mineral export earnings with sales totaling $349 million—a 67 percent increase. This was due to production from Rio Tinto's $6.5 billion Oyu Tolgoi mining investment. Mongolia's March 2014 overall trade turnover with China grew 9 percent over March 2013, even though the country's total trade turnover fell 1.6 percent (Reuters, April 23).

Financial Cooperation and the Asian Infrastructure Investment Bank

In late March, Mongolian Minister of Finance Chultem Ulaan and Shi Yaobin, the PRC Vice Minister of Finance, signed a Memorandum of Understanding agreement on cooperation in Ulaanbaatar. Shi also proposed that Mongolia become a founding member in the establishment of the PRC-initiated Asian Infrastructure Investment Bank, which seeks the participation of 15 Asian countries (montsame.gov.mn, March 28). During the subsequent April 28–29 visit of Chinese Finance Minister Lu Jiwei, Mongolian Prime Minister Norov Altankhuyag announced that due to the exceptional importance of infrastructure development to his landlocked country, the Government of Mongolia had agreed to become a bank founder (english.news.mn, April 28; montsame.gov.mn, April 29). While Lu was in Ulaanbaatar, a second meeting was held in Beijing of Chinese and Mongolian MFA officials from their respective Treaty and Law Departments to review the terms and relevancy of the 426 bilateral contracts and treaties which were established between 1949 and late 2012 (montsame.gov.mn, April 29).

The Chinese renminbi is now Mongolia's second most actively traded currency as bilateral ties in trade, economy and investment have become closer (Xinhua, May 6). The Bank of Mongolia said that in May it was extending for three years a bilateral local currency-swap line with the

People's Bank of China and double its size to 20 billion yuan to increase confidence in the foreign-exchange market and strengthen the "off-balance" reserves buffer. The latest such swap was made in early July (*The Mongolian Messenger*, July 10). Because Mongolian foreign reserves have fallen amid lower export prices for copper and coal, its currency holdings stood at $2.44 billion at the end of January, 40 per cent lower than a year earlier. Mongolia's tugrik has declined 20 percent in the past 12 months, the sixth worst performance among more than 100 exchange rates tracked by Bloomberg. This decline is despite the fact that in the first two months of 2014 Mongolia's exports rose almost 18 percent to $594.6 million, while imports fell about 24 percent to $613.9 million—making the trade deficit of $19.3 million 94 per cent lower than in 2013 (National Statistics Office as reported in english.news.mn, March 20).

Sino-Mongol Rail Ties

Mongolia plans to spend $5.2 billion to expand its railway network (Reuters, April 9). In early May, the Mongolian Government submitted a resolution to the Parliament to allow for a mix of Chinese and Russian-gauge rails in Mongolia—a change from previous Mongolian rail policy requiring the use of Russia's wider gauge standard. This has the potential to dramatically change the way Sino-Mongolian trade is handled and grows, because it will permit for the first time the building of international-standard (1,435 mm) narrow-gauge railroad spurs across the Mongolian border with China for transporting raw minerals. Effective April 7, the Mongolian state-owned giant coal company of Erdenes Tavan Tolgoi (ETT), in consortium with privately-held Mongolian Mining Corporation, will invest with Chinese companies led by state-owned mining group Shenhua to establish a joint venture to build and operate a 20 km border railway linking the huge coal field of Tavan Tolgoi (TT) in the South Gobi region via the Mongolian Gashuun Sukhait port. The Shenhua group reportedly will take a 49 percent stake in this joint venture. This project initially will build a 13 km standard gauge cross-border line from the nearest Chinese railhead north of Baotou (Gants Mod) to a transloading terminal in southern Mongolia where coal will be trucked from the mines by road. A second phase would extend the cross-border link with Russian-style broad-gauge (1,534 mm) a further 27 km to meet the 217 km broad-gauge coal railway from the Ukhaa Khudag coking coal mine, which is being built by South Korea's Samsung C&T under a $483 million contract. Shenhua in October 2013 signed an agreement to buy one billion tons of coal from Mongolia over 20 years, which is now delivered by costly trucks (Xinhua, March 22; railwaygazette.com, April 11). There are additional plans for the Chinese gauge between Tavan Tolgoi and Gashuun Sukhait, Sainshand and Zamiin Uud, and Khuut and Bichigt to be used for direct rails to China. Mongolia and China hope that establishing narrow gauge railways will make coal export stages easier and costs cheaper so Mongolian coal will be more competitive and thus boost exports (english.news.mn, April 8). However, the fact that new northbound rail spurs to Russia using the Russian wide gauge also will be constructed between Tavan Tolgoi and Sainshand, Huut and Choibalsan, and Erdenet and Mogoin Gol indicates that Mongolia still is committed to creating the rail infrastructure to link its minerals to a 'northern corridor' via the Trans-Siberian Railways to deliver to new customers in the Asia Pacific (*Udriin Sonin*, May 7).

Intensified Construction Projects

On May 10, the Mongolian cabinet finally decided to allocate $193 million from a Chinese soft loan worth $500 million, which was promised in 2011 when the two nations announced their strategic partnership, to finance the construction of a hi-speed road along the Tuul River in Ulaanbaatar. This "Street Project" will be supervised by Mongolia's Economic Development Ministry (Montsame, May 13). Construction projects are now beginning operations in the power sector through a concession agreement executed by the Mongolian Ministry of Energy with China Machinery Engineering Corporation (CMEC) in 2013. The most significant project is the 348MW Amgalan Thermal Power Project (TPP). Mongolian partner companies and the Energy Development Center are building earth works, flood facilities, and a draining system. According to Ch. Tsogtsaikhan of Amgalan TPP Pre-Service Administration, there are a total of some 1000 Mongols and 800 Chinese now working on the project. Although there have been delays on the Mongol side, it is expected that CMEC will put the heating furnace into operation by October 15. The Amgalan TPP will be constructed at a cost of $75.9 million and will supply heating to some 50,000 households—one-fourth of the total 1300MW needs of Ulaanbaatar (*The Mongol*

Messenger, May 16; infomongolia.com, February 4).

Conclusion

Meanwhile, the United States remains silent on Mongolia's ever-growing strong economic relationship with China. A bipartisan congressional delegation mission from the House Subcommittee on National Security led by Congressman Steve Chabot (R-OH), Chairman of the House Foreign Affairs Subcommittee on Asia and the Pacific, and Congressman Stephen Lynch (D-MA) visited Mongolia May 15–16 on a larger trip encompassing China and Ukraine. The stated purpose of the trip was "to conduct official discussions with high-ranking government leaders regarding political, economic and security issues affecting bilateral and regional relationships," but the only public statement emerging was a U.S. Embassy Ulaanbaatar press release that highlighted U.S.-Mongolian strategic relations and military cooperation (lynch.house.gov/press-release, May 15; U.S. Embassy in Ulaanbaatar, May 18).

Dr. Alicia Campi has a Ph.D. in Mongolian Studies, was involved in the preliminary negotiations to establish bilateral relations in the 1980s, and served as a diplomat in Ulaanbaatar. She has a Mongolian consultancy company (U.S.-Mongolia Advisory Group), and writes and speaks extensively on Mongolian issues.

***

Quality Over Quantity: A New PLA Modernization Methodology?

By Kevin N. McCauley

China announced a renewed push on military reforms in November 2013. A theoretical People's Liberation Army (PLA) publication titled "Transformation of Generating Mode of Warfighting Capability" (official translation of *zhandouli shengcheng moshi zhuanbian*) proposes an accelerated and focused methodology for modernization to implement a system of systems operational capability (integration of information/weapons systems and units—for a discussion of system of systems operations terminology, see *China Brief*, October 5, 2012 and March 15, 2013). Authored by Colonel Dong Zifeng, who has held numerous positions in the PLAAF and military educational institutes as well as serving as a joint operations expert at the Academy of Military Sciences (AMS), the book is intended to inform the PLA and specifically its effort at military modernization. The widespread adoption of the transformation concept by military publications suggests that the book may have influenced—or at least describes—an ongoing shift in the PLA's approach to modernization.

In contrast to the current strategic modernization plan, which has a very general focus spread over a timeline out to mid-century, the author's plan advocates a highly focused methodology and specific goals for accelerating and implementing the PLA's transformational effort. This plan emphasizes the creation of improved command structures, operational methods and training methods, but also targeted equipment modernization, to achieve goals such as making effective joint operations possible. Unlike the ongoing plan emphasizing a broad approach to mechanizing and then "informationizing" the military with modern hardware, reforms to command structures appear to be bureaucratically difficult to achieve, with no real change to date. Recognizing these challenges, Dong argues that the PLA's top modernization priority should be a focused effort to specifically develop system of systems operations with a flat command structure in order to enable integrated joint operations and other new operational methods.

In addition to the author's association with the AMS, there are a number of reasons to think that his proposals reflect the direction of current policy. In last year's defense white paper, the section on military modernization stressed the need to "speed up the transformation of the generating mode of combat effectiveness [warfighting capabilities]," the topic of the author's book, while omitting reference to the official three-stage strategic modernization plan. President Xi Jinping has also associated himself with a high-profile campaign for military reform, prioritizing implementing system of systems operations, integrated joint operations and other new operational methods. Finally, the book's topic—transforming the mode of generating combat effectiveness—is discussed regularly in the PLA press.

This does not necessarily mean that the author's proposed plan is supplementing or supplanting the official strategic modernization plan, but China analysts should be aware of the possibility of significant change. **[1]** This article

examines this proposal, as it contains a number of signposts for analysts to gauge possible ongoing or future changes in the PLA's modernization plan and efforts to accelerate the transformation process that could provide China with enhanced military capabilities to respond to territorial disputes or possible instability on the Korean peninsula.

Background

As with many PLA terms and phrases, the meaning of the transformation concept is opaque. When Dong and the PLA use the phrase "transforming the mode of generating combat effectiveness," they are talking about an effort to shift the focus of modernization from quantity to quality, increasing the warfighting potential of the PLA by embracing the revolution in military affairs based on information technology; fielding high tech equipment; improving professional military education and unit training; and adopting new, modern doctrines and tactics. Dong views this shift as key to overcoming challenges facing the PLA.

These problem areas include the PLA's fielding of multiple generations of weapons and equipment; contentious issues in theoretical research; concurrent development of mechanization and informationization; lack of recent combat experience; and a step-by-step development process *which threatens to leave the PLA behind the world's advanced militaries*. The intent is to accelerate modernization by focusing the effort on the key transformational areas of system of systems operations, establishing integrated force groupings and conceiving new operational methods (operational art and tactics). **[2]**

The author believes there are four main fulcrums for leveraging the PLA's transformation and increasing warfighting capabilities, which are also major themes in official PLA publications:

- The *leading role of information,* which is the dominant element in information age warfare
- *Flat control*, leading to new command and control relationships
- *System of systems operations*, providing integrated information systems
- *Comprehensive integration* based on systems of systems operations, leading to integration of combat and support forces with advanced capabilities (*Transformation*, pp. 1-2).

Basic Methods for Generating Combat Effectiveness

Generating warfighting capabilities based on quality involves the development and acquisition of modern systems, but also requires the PLA to create soldiers and organizational structures that can use them effectively. Dong believes there are *five basic methods to increase warfighting capabilities*, most of which are already discussed in existing PLA modernization plans. However, Dong proposes a comprehensive scheme to identify and create only the most effective equipment and institutional structures, rebalancing these five methods:

- Expanding quantity—the military structure, quantity and scale of equipment. This is a traditional model that the *Transformation* model relegates to a secondary status.
- Improve quality, including weapons and equipment, formation of new type operational forces, reform and improvements in military training using such means as advanced training bases, network and simulation training centers. These areas are currently being improved to a degree, but *Transformation* views this as an important method requiring new content and closer coordination.
- Reform the command structure to form a flat, efficient command system of systems; change force structure towards integrated joint operations forces; adjust forces and deployment to meet new operational requirements; and adopt innovative theories and new operational methods to increase the forces capabilities. The author views this as a new, key method to generate combat effectiveness, and these are key components of the recently announced military reforms.
- Building/seizing advantageous situations created by various actions globally, regionally, in theaters of operation or on a battlefield to accelerate the development of advantages into

deterrence, and if deterrence fails, transform advantageous situations into wartime victory. The author views this as the information age method of generating combat capabilities.

- Reform of military practices to support PLA transformation, such as increased use of computer simulations to determine optimal force structures, use of Battle Lab experimentation as a less expensive alternative to field exercises for testing new operational concepts and plans. This is occurring within the PLA, but perhaps not as extensively or in an integrated matter as the author proposes (*Transformation*, pp. 20-21).

Methodology for Combat Effectiveness Generation

Even though both Dong and the PLA want to speed up the modernization process, his methodology proposes a shift from a single long-term plan to an evolutionary cycle with updates throughout the process. The cycle includes:

1. Operational methods provide requirements for core technologies
2. A focused research and development process for weapons and equipment modernization
3. Integration of modern equipment into operational forces
4. Tactical innovation and experimentation to develop new operational methods, feeding new requirements back into the process

The core elements—operational methods, key technologies, weapons and equipment and operational forces—also drive the requirements for specific personnel skills and talents (*Transformation*, pp. 50-53).

The author's methodology to increase combat effectiveness by implementing the system of systems operations and joint operations capability consists of three stages (see figure 1). National security requirements lead to military capability requirements which drive the entire process, ending in battlefield testing. A feedback loop exists for newly developed concepts updating the process.

The first stage generates operational elements (basic combat capabilities such as command and control, reconnaissance or firepower), necessary for the generation of operational systems of systems in stage two, and finally leading to generation of new operational methods in the third stage. Generation of operational elements is influenced by requirements based on the international environment, military strategy, military technology and military theory, as well as the status of personnel, weapons and equipment and military organization.

The second stage is the generation of force groupings tightly knit with integrated C4ISR. This is defined as having a flat command, information dominance, and system of systems operations capability providing comprehensive integration of units and equipment--covering the four main fulcrums discussed above for leveraging the transformation and generation of warfighting capabilities. This stage is influenced by training, Battle Lab experimentation and testing, and warfare analysis. Testing and experimentation also leads to new theoretical development for possible feedback into the ongoing process.

The third stage, generating new operational methods, is considered the most important. This determines new operational art and tactics for employment by the new integrated force groupings (operational system of systems), producing enhanced warfighting capabilities.

Dong believes that new operational methods will lead to combat that is shorter in duration and limited spatially, which in turn increases war control, and thereby reduces risks and costs. These same ideas have been presented in PLA discussions of precision operations (See *China Brief* Volume 12 Issue 6) (*Transformation*, pp. 86-89).

Adopting a 'Transformation' Approach?

Even though the official three-stage strategic modernization plan was not mentioned in last year's defense white paper, it still appears to remain the general modernization plan. A *Jiefangjun Bao* article from February 2013 does refer to the three-step strategic modernization plan and the 2020 milestone for the second stage. The author does not provide timelines for his more focused modernization plan, or whether it is intended to supplant or supplement the more general strategic plan. Last year's

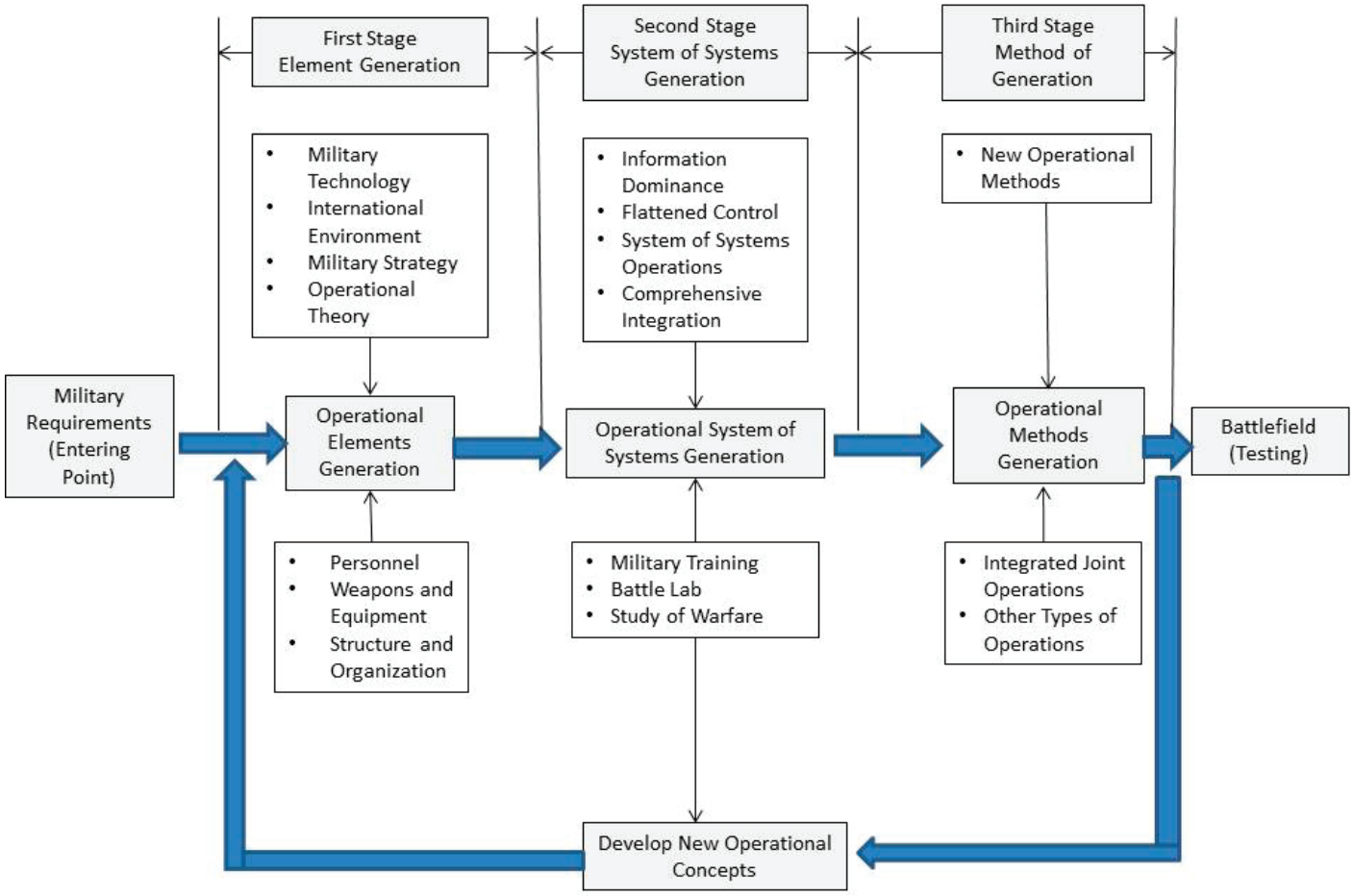

Figure 1: Plan for System of Systems Generation of Warfighting Capabilities (*Transformation*, p. 88)

defense white paper clearly emphasizes several times the need to accelerate modernization while specifically mentioning transformation of the generating mode of combat effectiveness. Table 1 shows a comparison of the two plans. Time will tell whether the author's modernization plan is adopted, although there is some evidence that at least similar concepts are becoming part of PLA modernization planning based on the white paper and the fact that system of systems operations and joint operations are an important focus of PLA research.

Developing new operational methods and concepts are a key element in generating warfighting capabilities. Battle Labs are considered by the author and the PLA as an important information age simulation and wargaming means to test new operational theories, verify concepts before moving to expensive field testing, and in the end generate warfighting capabilities. However, the PLA considers its Battle Lab system incomplete. Some Battle Labs have been established, but they act independently rather than coordinating work with other military operations laboratories. With the recent emphasis on standardization and high level direction in important issues, it would seem likely that the PLA will take a more centralized approach towards establishing a network of Battle Labs with coordinated research efforts in the future (*Transformation,* p. 37; *Jiefangjun Bao*, December 9, 2010, June 28, 2012, and February 4, 2010; *Zhongguo Tongxin She*, July 22, 2007; *China's National Defense in 2008*).

Dong's plan to accelerate PLA modernization appears to rely on establishing more precise goals then the strategic plan, and on speeding the development and implementation of new operational methods. Of course, accelerate is a relative term in "PLA time." Even as President Xi is reemphasizing military reform, the PLA press has stated that any changes would be deliberate, requiring repeated demonstrations and scientific assessments prior to implementation, as major reform initiatives can affect the entire military system (*Diversified*

Strategic Plan for National Defense and Armed Forces Building (official plan)		System of Systems Warfighting Capabilities Generation (proposed plan)	
Stage One	Lay a solid foundation by 2010	Stage One	Operational Elements (combat capabilities) Generation
Stage Two	Accomplish mechanization and make major progress towards informationization by 2020	Stage Two	Operational System of Systems (integrated force grouping) Generation
Stage Three	Basically reach strategic goal of modernization by mid-21st Century	Stage Three	Operational Methods (operational art and tactics) Generation

Table 1: Comparison Modernization Plans

Employment of China's Armed Forces; *China's National Defense in 2008*; *Jiefangjun Bao*, Febrauary 3, 2013; *China Military Online*, March 16). Again, it is not clear how this deliberate approach squares with the stated need to speed up modernization.

Possible Signs of a Change of Approach

Dong highlights key elements of his plan, giving analysts metrics to watch for a possible change and acceleration of the PLA modernization plan. These include key areas that he believes are required to build the synergistic effect between highly integrated forces and systems:

- Developing new operational methods and theories, and importantly, *accelerating the transition from theory into capability*. This is critical. Heretofore, it has taken the PLA extensive time to develop theories and operationalize them within the force. An example is PLAAF firepower support to the ground forces, which has been a research and experimentation focus since the early 1990s, but by the PLA's own admission is still not flexible.

- Significant downsizing and/or focusing fielding of standardized modern equipment to key units to allow for accelerated force modernization, and eliminate problems with units fielding multiple generations and types of equipment. This would support a single focus on implementing systems of systems operations capability in order to speed up the process, rather than the current dual focus on mechanization *and* informationization.

- Expansion and integration of Battle Labs, simulation and wargaming centers, and key training bases. This would be in conjunction with standardization and improvements in unit training, training evaluation, and military education.

- Construction of a force wide integrated C4ISR system in order to implement joint operations, including a long-promised flatter command structure (*Transformation*, pp. 25-28).

Conclusion

Transformation of generating mode of combat effectiveness, as described by the author, represents a more focused modernization effort to implement the key warfighting capabilities of system of systems operational capability and integrated joint operations viewed by the PLA as critical to winning future wars. The author views his methodology as a proactive approach to accelerate the slow, incremental progress towards modernization to date, in part by narrowing the focus of the modernization effort and by more rapidly developing and implementing new concepts to drive requirements for the PLA's transformation. The expressed need to accelerate modernization is not specifically addressed in either PLA literature or the author's discussion. This

requirement could be a recognition of the inadequacy of the current slow approach with unending research of new operational theories with a seeming inability to reach the implementation phase, or it could be in response to fears that territorial tensions or instability on the Korean peninsula could lead to conflicts sooner rather than later. However, the PLA press appears contradictory, stating the need to accelerate modernization, while at the same time stressing a careful, deliberate approach to avoid disrupting the military.

The PLA and the author both envision a smaller, leaner, flexible, high-tech military, capable of conducting new types of joint operations during a broad array of potential missions. President Xi's recently announced military reform reset demonstrates renewed pressure to achieve progress on these goals. Dong's plan represents a possible means to do so, and one which has attracted interest—but only time will tell if it is adopted, and whether it can overcome the obstacles that slowed former plans.

Kevin McCauley has served as senior intelligence officer for the former-Soviet Union, Russia, and China during his career in the federal government. He has written numerous intelligence products for decision makers and combatant commands, including contributing to the annual Report to Congress on China's military power. Mr. McCauley is currently researching and writing a book on Chinese warfare.

Notes

1. *Diversified Employment of China's Armed Forces*, (Beijing: Information Office of the State Council, 2013).

2. Dong Zifeng, *Transformation of Generating Mode of War Fighting Capability*, (Beijing: Military Science Publishing House, 2012) pp. 23-24. Hereafter *Transformation*.

***

China's Strategic Rocket Force: Upgrading Hardware and Software (Part 2 of 2)

By Andrew S. Erickson and Michael S. Chase

Part One of this article covered the modernization of the People's Liberation Army Second Artillery Force's (PLASAF) conventional arsenal and the "conventionalization of deterrence"—the creation of doctrines that rely on advanced non-nuclear weapons to deter U.S. and other international intervention in a regional conflict (read the first part in *China Brief*, Vol. 14, Issue 13). While PLASAF has made these changes, it has also upgraded its nuclear capabilities, including discussions of ways in which nuclear weapons can deter conventional attacks despite China's No First Use policy. But for upgraded hardware to achieve its goals, it must be commanded and operated by higher caliber, better-prepared soliders, a challenge that is increasingly important to this branch.

Enhancing Nuclear Deterrence Credibility

Deterrence is a moving target: To maintain its credibility, PLASAF must continue to improve specific conventional and nuclear capabilities. PLA publications highlight the growing importance of conventional deterrence capabilities, which continue to enjoy rapid qualitative and quantitative development. Meanwhile, Chinese military sources also emphasize the continuing relevance of nuclear deterrence. Even if only modest quantitative growth is pursued, this suggests a continual need to modernize nuclear forces and increase their sophistication to ensure that they outpace ballistic missile defense (BMD) and other potentially threatening developments.

The most recent edition of the *Science of Military Strategy*, published by the Academy of Military Science in 2013, underscores the importance of China's development of a "lean and effective nuclear retaliatory force," which it identifies as a key component of its "deterrence system" (*weishe tixi*). **[1]** PLA analysts see this as a challenge, because China faces a "complex nuclear security environment." The main adversary China must deter is the United States, but China cannot ignore other nuclear-armed countries in its neighborhood, such as India, which is also

modernizing its nuclear capabilities. PLA analysts also express concerns about technological developments they see as possible threats to the credibility of China's nuclear deterrent, most notably missile defense and conventional prompt global strike (CPGS) capabilities. (*SMS*, p. 171). PLASAF nuclear missile force modernization plays a central role in China's attempts to address these challenges.

From humble beginnings of uncertain capability, which relied on Mao's risk-acceptant rhetoric and "first strike uncertainty" (an enemy's inability to be completely sure it could successfully locate and destroy all of China's nuclear missiles with its own first strike) for much of its effect, China today is securing a more credible nuclear retaliatory capability. China's nuclear missile force currently consists of medium-range ballistic missiles (MRBMs) and intermediate-range ballistic missiles (IRBMs) for regional deterrence missions, and silo-based and road-mobile ICBMs capable of striking targets anywhere in the world. The National Air and Space Intelligence Center (NASIC) estimates that China's ICBM force will continue to grow by size and type, and that "the number of Chinese ICBM nuclear warheads capable of reaching the United States could expand to well over 100 within the next 15 years" (*Ballistic and Cruise Missile Threat, 2013*, p. 3). PLASAF's fielding of additional, more survivable mobile ICBMs with improved countermeasures and command, control and communications (C3) capabilities offers potential for a secure second-strike capability. Of particular note are improvements in nuclear C3. According to the U.S. Department of Defense (DoD), "Through the use of improved communications links, China's ICBM units now have better access to battlefield information and uninterrupted communications connecting all command echelons, and unit commanders are able to issue orders to multiple subordinates at once, instead of serially, via voice commands." **[2]**

Rhetorically, Beijing maintains a "no first use" (NFU) policy, and takes pains to emphasize this. Yet ambiguities have emerged concerning the precise circumstances under which it would apply. Some Chinese military publications suggest that China's nuclear capabilities could help deter conventional strategic attacks. Of course, this does not necessarily mean China would resort to nuclear escalation in response to any but the most severe conventional threats, but it does suggest that Beijing would rely on its nuclear retaliatory capability to constrain an adversary's options and wants potential adversaries to weigh this possibility carefully. As the authors of *Science of Second Artillery Campaigns* note, nuclear weapons are "a strong nuclear backstop for ensuring the status of large countries and a potentially huge resource for deterrence." **[3]** The fear of possible nuclear escalation could cause an adversary to be very cautious when fighting a conventional war against China, and this could constrain the enemy's options in ways that make it easier for China to conduct conventional military operations. Specifically, according to *Science of Second Artillery Campaigns*, "In local wars under informatized conditions, simply by moderately revealing nuclear strength, it is possible to flexibly use many types of deterrence methods; when the enemy uses informatized conventional air raids to attack us, they cannot help but to prudently consider the possibility that they might pay a price that would be very difficult to bear, thus achieving the objective of supporting conventional operations" (*SSAC*, p. 274).

Nonetheless, Chinese officials stress policy continuity, maintaining that they are merely pursuing a "lean and effective" nuclear force that meets China's evolving national security needs. Yet compared with the rudimentary nature of Beijing's earlier nuclear arsenal, its ongoing gradual augmentation and rapid qualitative enhancement is making a major difference. PLASAF silo-based and road-mobile ICBMs can strike targets worldwide and mobility is enhancing the survivability of China's strategic missile force. NASIC estimates that China's ICBM force will continue to improve not only qualitatively but also quantitatively.

As part of this significant force enhancement, China is reportedly developing and testing the DF-41, a road-mobile ICBM capable of carrying multiple independently targetable reentry vehicles (MIRVs) (Global Times, October 28, 2010; DoD 2014, p. 7). China has also tested a hypersonic glide vehicle (HGV), which it could eventually deploy in a nuclear deterrence role (*The Diplomat*, January 17). Important to PLASAF bureaucratic interests, DF-41 deployment and a possible future HGV can preserve its preeminent nuclear deterrent role despite the PLAN's moving toward conducting deterrence patrols with its new SSBNs.

The Human Element 2.0

In recent years, hardware has emerged as a relative strength of China's military, propelled by technocratic emphasis and drawing on tremendous amounts of foreign technology. For PLASAF, this includes an integrated command platform and other C4ISR capabilities. Yet the greatest need for improvement clearly remains in human capital. China's civil and military leaders clearly recognize this imperative, and are making revisions accordingly.

Improving personnel caliber is an essential foundation. The PLASAF recruits needed technical talent through the National Defense Student Program and "strategic marriages" with top universities including Tsinghua, Northwest Polytechnical, National University of Defense Technology, Information Engineering University and Technological University (*Rocket Forces News* [*Huojian bing bao*], January 3, p. 1). Similar civil-military talent cooperation has been underway for the past decade at the PLASAF Armament Research Institute (*Rocket Forces News*, December 28, 2013, p. 1).

Training under realistic conditions is likewise essential, and a subject of concerted focus. Perhaps most importantly, particularly in the Xi Jinping era, there appears to be a genuine effort at accurate self-assessment and continuous improvement. In December 2013, in PLASAF's official mouthpiece *Rocket Forces News* a major article stressed that Xi's directive to adopt "combat-realistic training" must be implemented substantively, and held up the U.S. and Russian militaries as exemplars in this regard. It emphasized: "In conducting actual combat conditioning training…. it is necessary to focus on the future battlefield… conduct confrontation with a powerful enemy, and stick close to actual combat in inspecting and examining training concepts, training methods and actual combat capabilities." "Strengthening actual combat awareness" must be achieved by "sticking close to the key points of actual combat" and "recognizing the future battlefield and understanding the future opponent." "Training principles," which "determine operational modes," must be transformed accordingly: "If we are to get the upper hand and win the initiative on the future battlefield, we must constantly transform the training principles… taking aim at the shortcomings… and constantly innovating training methods and tactics, use concept innovation to advance training model innovation." Finally, standards must be implemented strictly: "Conducting actual combat conditioning [*shizhan hua*] training requires strictly implementing the training standards and the through rigid implementation of the standards in order to spur effective boosting of training levels" (*Rocket Forces News*, December 14, 2013, p. 2B)

Accordingly, in March 2014, *Rocket Forces News* reported, "During a battalion-versus-battalion confrontational drill, two battalions which received orders for sortie at the same time arrived at the designated location at different times, with one arriving 10-odd minutes earlier than the other. Citing this case as an example, a brigade has launched an extensive discussion, which has in turn urged the troops to introduce some 'self-initiated actions' [*zixuan dongzuo*]." The commander in charge of the exercise maintains that "Although these 'self-initiated actions' deviate from normal 'standardized procedures' and 'violate regulations'… they are recommendable." Accordingly, "this brigade has extensively launched a massive discussion on the 'combat strength standards,'" generating "'lively and heated discussion' on how to realize the objective that 'Everything should be geared to enhancement of combat strength'" (*Rocket Forces News*, March 15, p. 2).

Such accounts have appeared regular in military media, promoting similar practices. Another example praised a special drill designed to retest logistics and repair skills that had emerged as a weakness in a "special evaluation and critique forum" following an exercise (*Rocket Forces News*, January 22, p. 2). (*Rocket Forces News*, January 22, p. 2). Improving equipment, logistics and communications support capabilities is also emphasized, including the use of civil-military integration (*Rocket Forces News*, December 17, 2013, p. 1; November 9, p. 3). Drills increasingly involve night operations, crossing regions; under extreme conditions and with fierce opposition (including simulated satellite surveillance and nuclear, chemical and cyberattacks) (*Rocket Forces News*, January 22, p. 2). Computer simulation is increasingly employed in training and teaching (*Rocket Forces News*, November 26, 2013, p. 4).

Non-commissioned officers (NCO) are regarded not only as an important bedrock of technical expertise but also command ability, with one brigade training 18 NCOs as "launch commanders" (*Rocket Forces News*, October 1,

2013, p. 1). This is all part of a larger regimen in which such traditional staples as camouflage, improvisation and political and psychological reliability continue to be stressed (See "Reforming the People's Liberation Army's Noncommissioned Officer Corps and Conscripts," *China Brief*, October 28, 2011).

Conclusion

In recent years, the Second Artillery has made impressive strides in the development of its nuclear and conventional missile capabilities. Furthermore, Second Artillery's institutional stature appears to have increased along with these force modernization developments, as reflected by the elevation of the PLASAF commander to membership in the Central Military Commission, along with the navy and air force commanders, in 2004, and the central role the missile force has been assigned in PLA joint campaigns, particularly with respect to the employment of conventional missile strikes to help the PLA seize information, air, and sea supremacy.

Acutely aware that meeting its increasing responsibilities will hinge on its human capital, PLASAF is strengthening recruiting and instruction, while improving realism of training to heighten readiness. Such training and command reforms are happening broadly across the PLA under Xi Jinping, who has emphasized preparing realistically to engage in high-intensity combat operations. PLA academics are working hard to translate Xi's general guidance into implementable specifics (see "Third Plenary Session Calls for PLA Reform and Restructuring" and "PLA Joint Operations Development and Military Reform," *China Brief* November 20, 2013 and April 9).

Looking forward, PLASAF development is likely to focus on modernizing its nuclear missile force, strengthening conventional missile strike capability, and "developing new types of warfare means" (*fazhan jinxing zuozhan shouduan*) to extend its capabilities to the space and network domains (*SMS*, pp. 232-233). First, China can be expected to continue to strengthen PLASAF's nuclear missile force, which will remain the cornerstone of China's nuclear deterrent posture even as China adds a sea-based component to its nuclear force. China can also be expected to further enhance PLASAF's conventional precision strike capabilities and eventually to add longer-range conventional missile systems to its inventory. In addition, capabilities in the space and cyber domains could further strengthen the missile force's contribution to China's strategic deterrence and conventional war-fighting capabilities.

Along with the PLA's growing air; naval; space and counter-space; and information and electronic warfare capabilities, the continuing modernization of China's nuclear and conventional missile forces is likely to pose increasingly serious tactical, operational and strategic challenges for the United States and its friends and allies in the region. Potential responses to China's conventional missile threat could include dispersal, hardening, longer-range strike systems and a variety of measures to deny, disrupt or degrade Chinese intelligence, surveillance, reconnaissance and targeting capabilities.

Andrew S. Erickson, Ph.D., is an Associate Professor in the Strategic Research Department at the U.S. Naval War College and a founding member of the department's China Maritime Studies Institute (CMSI). The views represented in these articles are his alone, and do not reflect the policies or estimates of the U.S. Navy or any other organization of the U.S. government.

Michael S. Chase, Ph.D., is a Senior Political Scientist at RAND and an adjunct professor in the China Studies and Strategic Studies Departments at Johns Hopkins University's School of Advanced International Studies (SAIS) in Washington, DC.

Notes

1. Junshi kexue yuan junshi zhanlue yanjiubu [Academy of Military Science Military Strategy Research Department), ed., *Zhanlüe xue* [*The Science of Military Strategy*], Beijing: Junshi kexue chubanshe [Military Science Press, 2013], pp. 148. (Hereafter: *SMS*)

2. Department of Defense, *Military and Security Developments Involving the People's Republic of China 2014* [Hereafter, DoD 2014], p. 28, < http://www.defense.gov/pubs/2014_DoD_China_Report.pdf >

3. People's Liberation Army Second Artillery Force, *Di er paobing zhanyi xue* [*The Science of Second Artillery Campaigns*] Beijing: PLA Press, 2004, p. 274. (Hereafter: *SSAC*)

*** *** ***