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PLA solider at railway station

In a Fortnight

TAIWAN'S INTELLIGENCE CHIEF WARNS ABOUT THE PLA'S GROWING STRATEGIC WEAPON SYSTEMS

By L.C. Russell Hsiao

The People's Liberation Army's (PLA) arsenal of strategic weapons systems is growing in spite of the cross-Strait détente. According to Tsai Der-Sheng, Taiwan's National Security Bureau (NSB) director-general, China has deployed a 'new' type of missile that will increase the PLA's capability in terms of range and accuracy to attack hardened targets like airfields and command and control centers in the Asian-Pacific region (*Taipei Times*, March 17). At a hearing held by the Legislative Yuan's Foreign Affairs and National Defense Committee on March 16, Tsai revealed that the missile is a "whole new type" in the Second Artillery's series of intermediate and intercontinental ballistic missiles: "It's more powerful, advanced and has a greater range than older types *of Dong Feng* [DF] missiles" (*Taipei Times*, March 17). Tsai also reasserted the claim he made back in August 2010 that the PLA has already tested and is now deploying the "carrier killer" DF-21D, which in February was confirmed by a report in a State-sponsored media (China Review News, August 20, 2010; *Global Times*, February 18). According to one military intelligence source cited by Taiwan-based *Liberty Times*, the estimated range of the DF-16 may be somewhere between 1,000 to 1,500 kilometers (km), and the target area would cover the U.S. military base on Okinawa (*Liberty Times* [Taiwan], March 17).

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Tsai's remarks during the "National Intelligence Work" report also revealed information beside the deployment of DF-16. In an interview largely missed by Western media, the PLA has reportedly deployed around 20 of each type of missiles (i.e. the DF-31, the DF-31A, the DF-5, and the DF-5A). Furthermore, the PLA deployed some 20 DF-21D anti-ship ballistic missiles (ASBM), and increased its arsenal of medium-to-long range missiles from 150 to 160 (China Review News, August, 20, 2010; *China Times* [Taiwan], March 17). According to U.S.-based *Defense News* citing a Taiwan defense source, China has already fielded up to a dozen DF 21-D in Qingyuan, Guangdong Province (*Defense News*, March 21). Furthermore, one unit of the PLA's Type 094 ballistic missile submarine is deployed in the South China Sea. Yet, since the JL-2 submarine launched ballistic missile is not yet in active service, the submarine is not combat ready. Alternatively, two units of the Type 093 nuclear attack submarine are deployed in the South China Sea, and the nuclear powered aircraft carrier, *Varyag*, is not scheduled to go into service until the end of 2012 (China Review News, August, 20, 2010; *China Times*, March 17).

An article in the *Global Times* published in February reported that the country's largest missile weapons manufacturer, China Aerospace Science and Industry Corporation (CASIC), is set "to complete research, production and delivery of this new generation of missile by 2015." Citing an anonymous military source, the report indicated that, "The subject under development is a medium- and long-range conventional missile with a traveling distance of as far as 4,000 kilometers." "The research is going smoothly, and the missile will be produced and ready for service in five years," the source said. The source also stated that "the Chinese-made Dong Feng 21-D missile, with a firing range between 1,800 and 2,800 kilometers, is already deployed in the army" (*Global Times*, February 18).

The new missiles appear to be part of a growing network forming a missile defense system that is both defensive and offensive, and equipped to deal with threats emanating from land, sea, air, space as well as cyberspace. In an interview with VOA-Chinese, the chief editor of *Asia-Pacific Defense Magazine*, Zheng Jih-wen, stated that China's deployment of different types of missiles aimed at Taiwan would present a dynamic and multi-layered threat (VOA [Chinese], March 16; *Global Times*, February 18).

Indeed, China's ballistic missile forces have increased in capability and are now starting to pose a considerable conventional threat beyond a Taiwan scenario. According to Tsai, China has more than 1,400 missiles aimed at the island (*Liberty Times*, March 17). With the deployment of more capable missiles aimed at Taiwan, the DF-11 and DF-15 missiles may be deployed in other theaters. This is a clear reflection of how China's missile technology and accuracy have improved in recent years.

In the final analysis, the extent to which the PLA's 'new' missiles are operational remains to be seen. Yet, it is clear that China's missile buildup will have a profound impact on U.S. strategic interests as China seeks to secure its regional interests in the Taiwan Strait and beyond. According to the *Taipei Times*, "Ballistic missiles with a range such as that attributed to the DF-16 could be deployed at the Second Artillery's Base 52 in Anhui Province and could target Taiwan as well as U.S. bases in the region, such as Okinawa and Guam." Moreover, "the faster re-entry of a longer-range ballistic missile such as the DF-16 would greatly reduce the effectiveness of Taiwan's PAC-3 missile interceptors that were acquired at great cost from the U.S. and which are still in the process of being deployed (*Taipei Times*, March 18). If Tsai's intelligence is accurate, this revelation would further complicate Chinese efforts to gain the trust of the Taiwanese people and caste into doubt the feasibility of entering into cross-Strait confidence building measures. Tsai's revelation may be seen as a sign of caution to the current Ma Ying-jeou administration as it considers the right pace to move forward in dialogue with its Chinese interlocutor in Beijing.

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Beijing's Blueprint for Tackling Mass Incidents and Social Management

By Willy Lam

China's previous five-year plans were generally focused on the economy and little else. Yet, the outline of the 12th Five-Year Blueprint on Economic and Social Development for 2011 to 2015 (hereafter Blueprint), which was released at the end of the National People's Congress (NPC) last week, had a lot to say about the Chinese Communist Party's (CCP) new imperative of imposing tighter control over the populace (See "Beijing's 'Wei-Wen' Imperative Steals the Thunder at NPC," *China Brief*, March 10). The Blueprint contained lengthy sections on buttressing public security, tackling "mass incidents," as well as implementing "social management" (*shehui guanli*), which are code words for boosting socio-political stability.

The conservative turn in Chinese politics was honed in by NPC Chairman Wu Bangguo's hard-line Legislative Work Report at the plenary parliamentary session. Wu, also a Politburo Standing Committee (PBSC) member, warned that abandoning CCP leadership and orthodox socialist precepts would "plunge the country into the abyss of internal chaos" (Xinhua News Agency, March 10; *Ming Pao* [Hong Kong], March 11).

The Blueprint began by pointing out that due to deep-seated changes in the domestic and global arenas, the Chinese leadership was "up against risks and uncertainties that are both anticipated and hard to foretell." "We must raise our consciousness about opportunities as well as risks—and take the initiative in adapting to changes in the environment," the document said. It added that Beijing "must effectively defuse various kinds of contradictions" in order to attain socio-economic goals in the coming five years. While the Blueprint enumerated challenges in fields ranging from resources and technology to human resources, it was obvious that internal political stability was a key concern. It cited "obviously increasing social contradictions" as a primary impediment to the nation's grand modernization objectives (Xinhua News Agency, March 17; China News Service, March 17).

The Blueprint disclosed for the first time the CCP leadership's elaborate plans to build a nationwide "*yingji xitong* [rapid-response system] for tackling emergency incidents." This was an apparent reaction to the estimated 100,000-odd mass incidents—including riots and disturbances—that had struck the country annually since the late 2000s. While the document did not mention "color revolutions," the CCP leadership has both before and after the NPC played up its resolve to prevent "hostile anti-Chinese forces" from fomenting disorder in the country (Christian Science Monitor, March 3; Reuters, March 21).

The Blueprint pointed out that the planned *yingji xitong* "must be under a comprehensive, unified command, rationally structured, capable of nimble reactions—and that it must have guaranteed capability and high-efficiency operations." The "backbone" of this mechanism would consist of the police, People's Armed Police (PAP) and People's Liberation Army (PLA) officers. The latter would be supplemented by public security experts and professionals, full-time and part-time staff in security-related enterprises; as well as volunteers. While no deadline has been mentioned, this labyrinthine *wei-wen* ("upholding stability") apparatus, which is under the overall supervision of the CCP's Central Commission for Political and Legal Affairs (CCPLA), is expected to be put together by 2015. It is apparently due to the huge costs involved that the *wei-wen* budget for 2011 was set at 624.4 billion yuan ($95.18 billion), which was 23.3 billion yuan ($3.55 billion) more than that of the PLA (See "The Wen-Wen Imperative Steals the Thunder at NPC," *China Brief*, March 10).

A related section of the Blueprint, which was devoted to the new concept of "social management," is focused on bolstering public order and harmony. As President Hu Jintao instructed at a Politburo meeting in February, social management was geared toward "promoting benevolent social order, and ensuring that society will be full of vigor on the one hand, and harmony and stability on the other" (Xinhua News Agency, February 19; *People's Daily*, February 20). To this end, social-management offices are being set up nationwide: there will be at least one such unit for every major street in big cities as well as for each of the country's 40,000-odd towns and rural townships. The Blueprint noted that apart from handling matters relating to public services and social-welfare

provisions, the new offices would take charge of the "comprehensive treatment of law-and-order problems," enhancing socio-political stability, and handling petitions filed by citizens with grievances against party and government departments. It is envisaged that these social-management outfits will work closely with the *Wei-Wen* Offices that have been established in most provinces and major cities since 2008 (*New York Times*, February 28; *Wall Street Journal,* December 9, 2009).

The CCP's much more aggressive approach to *wei-wen* requires the large-scale recruitment of volunteers. The Blueprint indicated that one out of ten residents in most community districts would become a "registered social volunteer." The massive deployment of *wei-wen* volunteers is apparently based on the experience of the Summer Olympics of 2008 and the Shanghai Expo of 2010, when up to 1 million vigilantes were recruited by the Beijing and Shanghai municipalities to maintain law and order. It was also during the Beijing Olympics that CCPLA officers first came up with the idea of putting together a "people's warfare-style" public-security apparatus to combat destabilizing forces (See "Beijing Revives Mao's 'People's Warfare' to Ensure Trouble-Free Olympics, *China Brief*, July 1, 2008).

Also significant is the Blueprint's recommendation that "social organizations" (*shehui zuzhi*), which is the official term of Chinese-style NGOs, be put under tighter government surveillance. Various party and government departments were urged to "institute a set of code of practices and criteria for social organizations' activities, and to raise the effectiveness of government supervision." The document noted that NGOs should be subject to a system of controls that consists of "a synthesis of legal supervision, government supervision, social supervision and self-supervision." Given the role that NGOs have played in color revolutions in Central Asia, the Middle East and North Africa, it is perhaps not surprising that Beijing is anxious about keeping close tabs on non-government-affiliated organizations, particularly those that seem to have ties with Western countries. The Chinese government's guarded approach was clearly demonstrated last year when the China branch of Oxfam, a London-based poverty-alleviation organization, was accused by the Chinese government of seeking to "infiltrate" the country (The Guardian, February 23, 2010; BBC News, February 23, 2010).

The Blueprint included a section on *junmin ronghe*, or the "synthesis between the military and civilians." The document laid utmost emphasis on "the fundamental principle and system of the party's absolute leadership over army." It also highlighted the ideal of the "unity between the army and the government, as well as between the army and the people." The PAP, whose major task is combating threats to internal security, should "boost its ability to handle emergency incidents, fight terrorism and uphold stability." As late patriarch Deng Xiaoping pointed out soon after the 1989 Tiananmen Square crackdown, the PLA and PAP were a "Great Wall of Steel" that safeguarded the CCP's power and prerogatives (Asia Times, March 11; Far Eastern Economic Review, September 2009). Under the *junmin ronghe* rubric, the PLA and the PAP are free to tap economic, technological and human resources in civilian sectors in peacetime as well as during a national crisis.

How about more political participation by the people as a means to defusing the country's mushrooming internal contradictions? The Blueprint did contain a section on "developing socialist democratic politics," where it indicated that Chinese citizens had "the right to know, the right to participate [in politics], the right to express themselves, and the right to supervise [the government]." It also pledged that Beijing would push forward "democratic elections, democratic decision-making, democratic management and democratic supervision" according to law. It is true, however, these and similar pledges made by the CCP leadership in recent years have been more rhetorical than substantial. For example, since Deng introduced village-level elections in 1979, little efforts have been made to extend the polls to higher-level administrations. While talking to reporters at the end of the NPC last week, Premier Wen apparently tried to explain the lack of progress on elections by saying that "this requires a [long] procedure and duration." He added that political reform could only be "implemented in an orderly fashion under a stable, harmonious social environment—and under the party's leadership" (China News Service, March 14; *Ming Pao*, March 15).

The CCP's call for tighter "social management" has come in the wake of a major swing toward conservatism—and quasi-Maoist ideals—in Chinese politics. This was attested to by the tough NPC address made by Chairman Wu Bangguo. Wu's "seven nos" viewpoint on Chinese

politics attracted international attention. They included no adoption of Western values; no adoption of a "system of multiple parties holding office in rotation"; no pluralization of the guiding [state] dogma; no tripartite division of power among the executive, legislature and judiciary; no adoption of a bicameral legislature; no to a federal system, and no privatization. He added that to ensure China's "correct political orientation," China's institutions, Constitution and the laws must safeguard "the status of the CCP as the country's leading core" (China News Service, March 9; The Associated Press, March 9; BBC News, March 10).

Moreover, President of the Supreme People's Court Wang Shengjun pledged in his NPC report that the courts would "diligently uphold social harmony and stability." "We will strengthen and be innovative about social management so as to bolster social harmony and stability," Wang said. "We will severely punish criminal activities that jeopardize state security and social stability." In an apparent repudiation of the principle of the independence of the judiciary, Wang vowed to boost senior judicial officials' "education in the party's [ideological] nature, party style and party discipline" so as to "enhance their resistance against corruption and against degeneration [into adherents of Western values]." The chief judge also urged his junior colleagues to follow the "strong leadership of the CCP central authorities under comrade Hu Jintao and to raise high the great flag of Chinese socialism" (Xinhua News Agency, March 19; Sina.com, March 19).

According to liberal intellectual Bao Tong, the CCP's renewed determination to spurn so-called Western norms would only exacerbate the country's socio-political tensions. Bao, once a close aide to ousted party chief Zhao Ziyang, pointed out that values such as privatization, pluralistic political norms and the tripartite division of power were "good systems universally recognized by the international community." He added that only by adopting global democratic standards can the CCP "achieve real stability and real social harmony" (Radio Free Asia, March 19). The methodical way in which the Blueprint—and senior CCP cadres—has gone about reinstating quasi-Maoist ideas and institutions, however, means that the hopes of Bao and other progressive intellectuals may be dashed at least in the short-to-medium term.

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A Chinese Assessment of China's External Security Environment

By Shen Dingli

An assessment based on a Chinese government white paper and recent report published by a leading think tank on China's external security environment suggest that Beijing perceives that it is facing unprecedented external challenges. On January 11, China's Ministry of Foreign Affairs (hereafter MFA) revealed—exclusively through Hong Kong-based *Wen Wei Po*—some key parts of its annual *2011 White Paper on China's Diplomacy,* which highlighted the country's foreign policy and its views on the "international situation" (*Wen Wei Po* [Hong Kong, January 11). A day later, a leading Beijing-based think tank, the Chinese Academy of Social Sciences (CASS), published *Yatai Lanpishu* (*Asia-Pacific Blue Paper*), which outlined a turbulent and grim outlook for China's peripheral security environment in the years ahead. Given the authority of the two publications, it is worthwhile to attach importance to the analysis and further elaborate on China's external security environment.

Summary

The analysis in both documents focused on China's changing external security environment. The *Wen Wei Po* article reported that the white paper highlights five features in China's international situation for 2010. First, while the global economy has been slowly recovering, development issues are becoming more acute. Second, the international situation is moving on a more balanced path. Third reform of the governance mechanism in the global economy has been making new headway. Fourth,

the international security situation is becoming more complex. Fifth and lastly, various international thoughts are more actively interacting among themselves (*Wen Wei Po* [Hong Kong, January 11).

The *CASS Asia-Pacific Blue Paper* underscored the challenges facing China's peripheral environment in terms of four types of external trends and threats. According to the report: First, the "return" of the United States to Asia has made China less appealing to some of its neighbors, through tapping some long existing disputes and incidental security accidents. Second, instability in Northeast Asia (i.e. North Korea) has become the most serious security challenge to China's peripheral defense, particularly because of the *Cheonon* incident and *Yeonpyeong* artillery shelling. Third, maritime disputes have become an important source of security tension along China's periphery. Fourth, some non-traditional security issues—water security in particular—have affected China's stability and its regime security, and China's relations with some neighbors (World Journal, January 13).

China's External Environment

Indeed, China's external relations—especially toward East Asia—have experienced a great deal of turbulence over the past year, particularly in terms of Sino-Japanese relations. China demanded that Tokyo immediately release the captain of a Chinese fishing boat that collided with a Japanese government vessel over a fishing row near the disputed Diaoyu Island (Senkaku Islands). Though China has long claimed sovereignty over the disputed island, its high-handed manner, which included curtailing the export of rare earth metal to Japan during the dispute—which may have been partly motivated by domestic consumption—was unhelpful for its public relations with Japan at-large. As a consequence, America's position shifted from being vague in defending Japan over this island under dispute to being more explicit and firm.

As the *CASS Asia-Pacific Blue Paper* pointed out, the most serious challenges facing China are from the Korean Peninsula. In 2010, North Korea did not return to the Six-Party Talks for dismantling its nuclear program. Instead, Pyongyang staged a series of dangerous moves affecting inter-Korean relations. In Beijing's perspective, although it is not certain that Pyongyang was the culprit behind Cheonan's sinking, North Korea's artillery barrage on Yeonpyeong is indisputable. China could have been under external pressures by protecting Pyongyang at the United Nations Security Council (UNSC) over both the Cheonan incident and Yeonpyeong barrages (World Journal, January 13).

China's security environment is increasingly challenged by the United States in that the latter has taken the opportunity presented by regional tensions to shore up its alliance with both South Korea and Japan, as well as through trilateral defense coordination. If the United States' "return" to East Asia has not been enough, Washington is also apparently revamping its relations with some Southeast Asian countries and urging these nations to hedge against China's rise. In July 2010, Secretary of State Clinton openly challenged China's position on the South China Sea in her address to the 17th ARF Ministerial Meeting in Hanoi, which was bluntly rebuffed by her Chinese counterpart.

Why Challenges Emerge

While observing the difficulties, it is far more significant if the Chinese leadership could better understand why these challenges have emerged and how China may have contributed, or could possibly avert their emergence.

China's Own Rapid Rise

China's rise is a source of its growing confidence, but if China rises too fast and acts overly-confident, then it may lead to a source of tension between China and other nations.

Measured by GDP, China grew from $1 trillion in 2000 to $5.8 trillion in 2010, increasing some 480 percent over a span of one decade. By comparison, the United States' GDP increased from $10 trillion in 2000 to $14.6 trillion in 2010, an increase of 46 percent. Therefore, China's growth rate over the past decade is 10 times higher than the United States. If the growth rates were to remain constant, China could surpass the United States in terms of GDP in another decade.

Similarly, China's official defense budget for 2010 was $78 billion, which was 50 percent higher than Japan, and 150 percent more than India. With the 2011 official defense budget at $91.5 billion, it could be worth the sum of Japan

and India. Even if China has the most benign intentions and implements greater transparency, the pressure on its neighbors, due to such an increase, would be predictable. A number of China's neighbors are apprehensive about Beijing's fast rising power and are trying to manage their response, including through dialogue and hedging.

Lack of Trust in Sino-U.S. Relations

China has long argued that U.S. weapons sales to Taiwan are insulting and intolerable. Yet, Beijing has bided its time in the belief that the United States would respect China's rise and end its interference in such "internal affairs." Against the backdrop of the global financial crisis and U.S. commitments in Afghanistan and Iraq, Beijing may have concluded that the time to end U.S. weapons sales has come. That may be why a year ago, China demanded that the United States end such sales, or the United States would be "truly" sanctioned. China did so, despite acting against its own interests by freezing mil-to-mil exchanges in 2010, a routine type of retaliation, no different from past tensions.

Unbalancing the Koreas

In addition to the United States, North Korea is increasingly becoming a challenge for Chinese leaders. China's North Korea policy is, at best, contradictory. While Beijing appears to be trying to move its relations with Pyongyang from a tongue-and teeth type to a more normal state, it continues to protect the "traditional" bonds, and therefore prevents the North from being sanctioned for its behavior. For instance, the UNSC has ordered comprehensive sanctions against the North for its nuclear/missile development, short of humanitarian aid. Yet, China is reportedly by the Source Korean press, to be in discussion with North Korea to develop the latter's harbors and other infrastructure (*Ta Kung Pao* [Hong Kong], September 4, 2009). It could have moved beyond the UN limit of "humanitarian purposes." Furthermore, after the first wave of the Yeonpyeong shelling in November 2010, China was silent, and was unhelpful in order to prevent the North from threatening a second wave in December.

On the contrary, China has treated South Korea, its strategic partner, rather differently. After the Cheonan sinking, China waited five weeks to issue its condolences, which stands in sharp contrast to its two high profile welcomes to the North's supreme leader last spring. In the Yeonpyeong case, China neither accused the South for staging a shelling exercise too close to the North, nor condemned the North for shelling Yeonpyeong and violating international law. China's unwillingness or inability to play a fair role on these matters undercuts its credibility and strength as a responsible stakeholder and honest broker. This could have partly contributed to the deterioration of its external sphere of influence.

Maritime-based challenges

China is facing more security challenges on the maritime front, and has had a number of disputes with some ASEAN neighbors concerning their claims over territorial waters in the South China Sea. In addition, China has increasingly had disputes with the United States regarding the right of foreign military ships and airplanes to enter China's Special Economic Zone and airspace. Thus far, China and the United States have been unable to resolve their disagreement in interpreting the UNCLOS (UN Convention on the Law of the Sea) on the foreign accessibility of the EEZ.

Beijing and Washington have also clashed, perhaps unnecessarily, over "China's core national interest concerning South China Sea." Core national interests shall be most important in terms of substance, and therefore most narrowly defined in terms of scope.

Regarding sovereignty, core national interests shall only be defined as China's sovereign soul, space and waters within 12 nautical miles from its sea baseline. All others—adjacent water, the rest of exclusive economic zone, and the entire South Sea as contained by the "nine-dashed-lines," except for those islands that China claims and the associated territorial waters—are not part of China's core interests. By resolving these issues, both parties could help regain the others' trust and respect, and would help secure a legitimate security environment.

Conclusion

The brief survey above indicates that China's complicated security environment may be the outgrowth of three factors: external pressures, China's fast rise and its own performance, as well as its interactions. U.S. security

pressure on China obviously persists, but the way Beijing has handled the situation increasingly accounts for the complexity of its security situation. The mutual distrust and suspicion between China and other parties, especially the United States, at a time of China's rise, enhances mutual hedging. Hedging is not necessarily negative, because it can be framed as a part of a realist, precautionary and preventive strategy. Generally, hedging helps prevent the burst of a sudden disaster. Yet, hedging is not always constructive, as nations would be able to save resources for cooperation if mutual trust can be established.

While China's clout still could not prevent the U.S. arms sales to Taiwan, it has become more influential in many international affairs, and has already had some impact in alleviating regional tensions and global concerns. Its newly established role in the G-20 is largely constructive, and its official development aid to other developing countries, with total amount more than what the World Bank delivered in 2010, has contributed to a decrease in poverty rates for the underdeveloped. These are its positive sources of hard and soft power.

If China reformed and modified some of its foreign policy measures, regional tension would ebb. It would thus be in a better position to overcome those challenges that were outlined by the White Paper and Blue Report. In fact, dealing with maritime disputes primarily through international law, stabilizing Korean Peninsula situation by being proactively balanced, and working with the United States to allay each other's legitimate concerns, are the three remedies that China could possibly take to soothe its external environment.

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The PLA's "Orient Express": Militarization of the Iron Silk Road

By Christina Lin

China's rise on the international stage has been accompanied by an increase in its military's presence. Beijing's expanding ambition is prompting calls on the country's leaders to be more proactive in protecting its national interests. These calls by Chinese analysts have raised concerns about the military's capability to mobilize troops to defend the country's vast borders (*Ta Kung Pao* [Hong Kong], September 24, 2009; *Jing Bao* [Hong Kong], January 29, 2010). For example, in the aftermath of the April 2010 Kyrgyzstan crisis when violent protests forced the collapse of the government, Chen Xiangyang, an associate researcher at the Chinese Institute of Contemporary International Relations (CICIR), called for a "Large Periphery" strategy to safeguard China's neighboring areas. Chen's call was echoed by senior Chinese military leaders about possibly intervening in Central Asia (*Ta Kung Pao* [Hong Kong], September 24, 2009). The Hong Kong-based *Jing Bao* back in a January 2010 article argued that railways—and their military significance—need to be infused into Chinese leaders' strategic lens when exporting railway technology as they enhance military power projection (*Jing Bao* [Hong Kong], January 29, 2010).

Indeed, in applying this strategic vision, on November 17, 2010, the Chinese People's Liberation Army (PLA) took the Shanghai-Nanjing express train for the first time to return to their barracks after completing security duty at the Shanghai World Expo 2010 (*China Army,* November 19, 2010). According to the Military Representative Office of the PLA stationed at the Shanghai Railway Bureau, the Shanghai-Nanjing express railway is an inter-city railway that can run at a maximum speed of 350 kilometers (km) per hour. Some Chinese military analysts touted this as an ideal way for the PLA to project troops and light equipment in military operations other than war (MOOTW) (*China Army,* November 19, 2010).

China has built rail lines to Tibet, is building connections to Nepal, and is planning high-speed rails to Laos, Singapore, Cambodia, Vietnam, Thailand and Burma (Myanmar) (Xinhua News Agency, October 17, 2010; Xinhua News Agency, December 8, 2010; *Foreign*

Trade, October 25, 2010). On November 15 last year, then Iranian Foreign Minister Manouchehr Mottaki announced that Iran, Afghanistan, and Tajikistan had agreed to cooperate with China to build a China-Iran rail link from Xinjiang, passing through Kyrgyzstan, Tajikistan, Afghanistan and finally arriving in Iran (*People's Daily Online,* November 18; *Press TV,* December 10, 2010; *Global Military,* November 20, 2010; *South Asia Analysis Group,* Paper no. 4178, November 19, 2010). The longer plan seems to connect westward into Iraq (where China has large oil & gas investments), Syria, Turkey, and onto Europe (*Press TV,* August 6, 2010; See "Syria in China's New Silk Road Strategy," *China Brief*, April 16, 2010; August 19, 2010). This is based on an overall UN-sponsored Trans-Asia Railway (TAR) network to link China to Europe, using the Middle East as a transit hub (*Move On Inc,* November 15, 2010).

Although the UN engineered the TAR agreement, China has done more than any other nation to re-forge trade and transport links to reestablish the Silk Route. Negotiations are already underway with 17 countries across Eurasia. With China's high-speed trains having clocked speeds as high as 486.1 km/h (302 mph) (*People's Daily,* September 28, 2010; *People's Daily,* December 9, 2010; Xinhua News Agency, December 8, 2010), and the PLA aggressively upgrading its long-range combat capabilities by using rail as logistical support for its air force (PLAAF) and troop projection, this new 'Orient Express' across the revived Silk Road will have important military and strategic implications for U.S. and Western interests in the region.

Militarization of the Iron Silk Road

Military requirements are part of China's rail development, and the PLA actively participates in the design and planning of China's high-speed rail (*Xinhua News Agency,* December 7, 2010). For example, Chengdu Railway Bureau has 14 military officers taking lead positions in key departments at all major stations, are tasked to coordinate railway planning, design, construction, timing of requirements and track implementation *(Xinhua News Agency,* December 7, 2010). Shenyang Railway Bureau, which is in the strategic location of Liaoning Province next to North Korea, Inner Mongolia and the Yellow Sea, has also established a regional military transportation management mechanism with the PLA (Xinhua News Agency, January 12, 2010). According to the Military Transportation Department of the PLA General Logistics Department (GLD), over 1,000 railway stations have been equipped with military transportation facilities, thereby establishing a complete railway support network that enhances the PLA's strategic projection capability (*PLA Daily,* February 4, 2010; *Defense Professional,* February 4, 2010).

GLD had cooperated with the PRC's Ministry of Railway in 2009, and fulfilled over 100 military requirements for 20 odd railways in China with the capability of military transportation (*PLA Daily,* February 4, 2010). In 2009, large sums of money were invested to build military transportation facilities for a few railway stations and military platforms for loading and unloading materials. This investment was made to meet military requirements used for activities such as the Shanghai Cooperation Organization's (SCO) Peace Mission in 2010 (*PLA Daily,* February 4, 2010; *Defense Professional,* February 4, 2010). GLD is actively involved through the entire process of the railway construction, varying from the programming to the completion of the railways. For example, when building the railway from Kunming, capital of Yunnan Province, to Nanning, capital of Guangxi Zhuang Autonomous Region, in order to meet troop maneuver requirements the Ministry of Railway had to revise a partial route and prolong 12.4 km of railways at an increased cost of 1.55 billion yuan ($232.66 million) (*PLA Daily,* February 4, 2010).

With China's expansionist policy and infrastructure projects toward its neighbors, some analysts are beginning to sound the alarm on the militarization of these projects.

Central, Southeast, and South Asia

For example, Konstantin Syroyezhkin, in Kazakhstan's Institute of Strategic Studies, points out the rapid development of road and railroad infrastructure in Central Asia with Chinese participation may be used for future PLA troop deployments in case of a serious conflict threatening China's security or strategic interests (See "China's Expansionist Policy Toward Kazakhstan Takes a New Turn," *Eurasia Daily Monitor,* November 17, 2010; Kazakhstanskaya Pravda, November 9, 2010). This concern is corroborated by the recent SCO Peace Mission 2010 military exercise, whereby China transported troops to Kazakhstan by rail (See "China Showcases

Expeditionary Military Power in Peace Mission 2010," *Eurasia Daily Monitor,* September 28, 2010).

Likewise, other countries such as Vietnam, and India, as well as the Tibet Autonomous Region share the same concern. Vietnam for one rejected China's high-speed railway technology ($32.5 billion) in favor of Japan's Shinkansen technology ($55 billion) despite its higher cost (Comhaha.com, December 7, 2010). On June 19, 2010, Vietnam's National Assembly voted down China's high-speed rail plan. According to Chinese language magazine *Yazhou Zhoukan*, some Vietnamese politicians oppose adopting Chinese high speed rail technology out of the fear that China might use it to transport PLA troops to invade Vietnam, in reprise of its 1979 Sino-Vietnam War (*South China Morning Post,* July 19, 2010).

In the Tibet Autonomous Region, China's high altitude Qinghai-Tibet railway that opened in 2006 is being used as a supply line to enhance PLAAF mobilization capability (*People's Daily,* 4 August 2010; *PLA Daily,* 3 August 2010; *The Hindu,* August 6, 2010). On August 3, 2010, *PLA Daily* reported that a train loaded with important air combat readiness material for the PLAAF arrived in Tibet via the railway. China is rapidly upgrading railways and airports in Tibet, with four operational airports and a fifth one under construction (*South Asia Analysis Group,* Paper No 3966, August 5, 2010; *Defense Update,* December 20, 2010). During the March 2008 Tibetan protests, the Qinghai Tibet rail enabled rapid PLA deployment. Within 48 hours, at the start of Lhasa riots, T-90/89 armored personnel carriers and T-92 wheeled infantry fighting vehicles appeared on the streets—apparently from the 149th Division of the No. 13 Group Army under the Chengdu Military Regional Command (UPI Asia Online, June 27, 2008). This was indicated by the "leopard" camouflage uniforms specifically designed for mountain warfare operation from the 149th Division (UPI Asia Online, June 27, 2008). Should Sino-Indian relations ever deteriorate to the verge of military confrontation and if riots in Tibet spread, the PLA's Mountain Brigades can rapidly deploy to the region via the railway. Indeed, railway and road construction have been China's Himalayan strategy for decades—as the PLA prepared to annex Tibet, Mao Zedong advised it "to advance while building roads" (Asia Times Online, October 16, 2010).

The PLA's Military Rail Transport to Greater Middle East?

China-Iran Railway

In October 2010, the transport ministers of China, Kyrgyzstan, Tajikistan, Afghanistan and Iran signed an agreement in Dushanbe, Tajikistan, to commence China-Iran railway construction (*Asia Plus* [Tajikistan], October 28, 2010). The railway from Xinjiang, China, would pass through Kyrgyzstan, Tajikistan, and Afghanistan, arrive in Iran and split into a southern line to the Gulf and a western line to Turkey onto Europe (Global military, November 20, 2010). Earlier in August, China and Iran had signed a $2 billion agreement on construction of the railway network in western Iran, which will continue westward into Iraq, eventually connecting with Syria, Turkey and the Mediterranean coastal countries (People's Daily Online, October 18, 2010; *Press TV,* August 28, 2010).

China-Turkey Railway

Around the same time, in October 2010, Turkey and China elevated their relations to one of "strategic partnership," signed deals for high-speed rails in Turkey to eventually link with China, upgraded their military ties, and participated in the traditional NATO air combat exercise of Anatolian Eagle—with China replacing Israel and the United States (*Los Angeles Times,* November 16, 2010; See "China-Turkey Strategic Partnership: Implications of Anatolian Eagle," *China Brief,* January 14). China will extend $30 billion to construct 7,000 km of high-speed rail lines across Turkey, as well as upgrading rail links between Turkey and Pakistan and planning a railway around Lake Van to Iran and Pakistan (*Asia News,* October 28, 2010; *China Daily,* October 9, 2010; *Today's Zaman,* October 15, 2010; *Hurriyet,* October 15, 2010). Moreover, China has invited Bulgaria to join Turkey in its Eurasian high-speed rail plan (*China Daily,* October 29, 2010). China offered huge loans for construction in return for the use of Bulgarian rivers, seaports and airports, as transit hubs onto Western Europe (*China Daily,* October 29, 2010).

Given the Sino-Turkish strategic partnership and anticipation of future military exercises, Chinese railways could enhance PLA military projection and presence in

the Middle East and wider Black Sea region. In addition to Chinese warplanes over the Black Sea region during the October 2010 Anatolian Eagle exercise, Chinese special op forces conducted joint exercises at a Turkey commando school in early November (*World Tribune,* November 12, 2010; *South China Morning Post*, November 9, 2010). With reports of PLAAF refueling in Iran en route to Turkey, high-speed rail could enable logistic support and transport of combat readiness materials in the future (*Hurriyet,* October 11, 2010).

Missing Links—Iraq and Afghanistan

While China is constructing railways across Eurasia, Iraq and Afghanistan still present significant missing links due to the security situation and large presence of U.S. and NATO troops. Yet, when the United States' draw down, China may try to push for UNPKOs to take over and deploy the PLA under blue berets to protect China's energy and strategic interests (*China Daily,* September 28, 2010). It has a $3.4 billion investment in the Aynak copper mine in Afghanistan as well as various oil and gas fields in Iraq (*China Daily,* September 23, 2010; *China Daily,* June 10, 2010). China will also likely use SCO to foment regional cooperation for constructing the railways through Afghanistan to Iran, eventually linking with Iraq. China and Iran are not interested in joining western-led initiatives, such as the Transport Corridor of Europe, Caucasus, and Asia (TRACECA), which is also known as the "new Silk Road." Rather, they want to forge their own projects and not be beholden to Western interests or sanctions.

Conclusion

China's ambitious high-speed rail projects across Asia and the Middle East have important strategic implications. It links up poorer regions with more prosperous regions, provides jobs during an economic downturn, and allows Chinese military and security services to better project power both within and outside the country's borders. While air transport is faster, it is limited to fewer people and lighter gear, whereas rail is a crucial means for moving soldiers and heavy equipment, and is much easier to sustain logistically.

As China's economic and energy portfolio continues to increase in the Greater Middle East, there may be future conditions under which the PLA might deploy troops using high-speed rails for MOOTW to protect its strategic interests. Indeed, in January 2011 there were reports that the PLA had deployed troops to the economic zone of Rajin-Sonbong in northeast North Korea in order to "guard port facilities China has invested in" (*The Chosun Ilbo,* January 17, 2010). Whether this is a telltale sign of what may happen with China's interests in Afghanistan, Iraq, and elsewhere, will still remain a mystery for the future of the PLA's Orient Express.

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Defense and Deterrence in China's Military Space Strategy

By Michael S. Chase

China's theory of space deterrence may be a work in progress, but Beijing is already developing an impressive array of counter-space systems. Indeed, the capabilities that China is working on go beyond the direct ascent anti-satellite (ASAT) weapon, successfully tested in January 2007. The test demonstrated its capability to destroy satellites in low-earth orbit and was followed by a missile intercept test in January 2010. According to the 2010 Department of Defense (DoD) report on Chinese military developments, "China is developing a multi- dimensional program to improve its capabilities to limit or prevent the use of space-based assets by potential adversaries during times of crisis or conflict" [1]. In addition to the direct ascent ASAT, China's capabilities include foreign and domestically developed jamming capabilities, and the inherent ASAT capabilities of its nuclear forces. In addition, "China is developing other technologies and concepts for kinetic and directed-energy (e.g. lasers, high-powered microwave, and particle beam) weapons for ASAT missions" [2]. According to Chinese analysts, along with the increasing its importance for military and commercial reasons, space is becoming an important domain for the defense of national security and national interests [3].

Background

Chinese strategists regard space as a crucial battlefield in future wars. Chinese military publications characterize space as the high ground that both sides will strive to control in informatized local wars because of its influence on information superiority and its importance in seizing the initiative in a conflict [4]. Chinese analysts write that space systems serve as key enablers by providing support in areas such as intelligence, surveillance, and reconnaissance (ISR), early warning, communications, navigation and positioning, targeting for precision weapons, surveying and mapping, and meteorological support. Chinese analysts also portray space systems as force multipliers that support joint operations and enhance the effectiveness of ground, air, and naval forces.

In keeping with this emphasis on the importance of space systems in contemporary military operations, China is making major strides in improving its own space capabilities [5]. According to the 2010 DoD report, "China is expanding its space-based intelligence, surveillance, reconnaissance, navigation, and communications satellite constellations" [6]. As China places more satellites into orbit, the PLA's reliance on space systems is growing. China's military is becoming more dependent on space capabilities for intelligence, surveillance, reconnaissance, navigation and positioning, as well as communications. Chinese military publications suggest that China still sees itself as far less dependent on space than the United States, but they also recognize that with this increasing reliance on space comes greater vulnerability. Many Chinese analysts believe that China's space systems face a variety of potential threats. Consequently, they argue that the PLA needs to be able to protect its space assets through defensive measures or deterrence.

Chinese Perceptions of Foreign Threats to Chinese Space Systems

A review of Chinese writings on military space operations indicates that Chinese strategists are concerned about a wide variety of perceived threats to Chinese space systems. In particular, Chinese analysts characterize U.S. space policy as inherently threatening to China's interests because of its emphasis on space dominance. As Zhang Hui of Harvard's Belfer Center for Science and International Affairs writes, "Many Chinese officials and security experts have great interest in U.S. military planning documents issued in recent years that explicitly envision the control of space through the use of weapons in, or from, space to establish global superiority" [7]. Similarly, according to Bao Shixiu, a senior fellow at the PLA's Academy of Military Science (AMS), "the only conclusion that can be drawn is that the United States unilaterally seeks to monopolize the military use of space in order to gain strategic advantage over others" [8]. Given that China must protect its own interests, Bao argues, "China cannot accept the monopolization of outer space by another country." Consequently, he asserts that U.S. space policy "poses a serious threat to China both in terms of jeopardizing its national defense as well as obstructing its justified right to exploit space for civilian and commercial purposes" [9]. Chinese writers also assert that U.S. space war exercises reflect the growing militarization of space. Yet Beijing's concerns are not limited to the realm of policy statements and war games. Indeed, some Chinese strategists appear to believe that other countries are actively developing counter-space capabilities that could threaten Chinese satellites.

Some Chinese writers discussed what they characterize as a long history of ASAT research, development, and testing in the United States and Russia dating back to the Cold War [10]. Like their Western counterparts, Chinese writers divide these potential threats into two major categories: "soft kill" and "hard kill" [11]. Soft kill threats can cause temporary loss of the effectiveness of space systems, causing them to be unable to carry out operational functions. According to Chinese military researchers, the main methods of soft kill anti-satellite attack include electronic warfare and computer network attacks [12]. In contrast to soft kill threats such as jamming, hard kill capabilities are intended to cause permanent damage to spacecraft. Chinese writers identify kinetic energy weapons and directed energy weapons such as high-energy lasers as the main hard kill ASAT threats. Other Chinese writings offer more detailed discussions of perceived threats from a wide range of systems, such as kinetic energy interceptors, laser ASAT systems, nuclear ASAT systems, microwave weapons, and space planes that could be used to disable or destroy an adversary's satellites [13]. In addition, some Chinese authors assert that U.S. missile defense interceptors provide the United States with an inherent ASAT capability [14].

In all, according to Chinese analysts, as a result of the actions of the world's major space powers, space war is no longer the stuff of science fiction. Indeed, they argue that it is already more a reality than a myth. Consequently, they conclude that China must be prepared not only to degrade an adversary's ability to use space, but also to protect its own space capabilities. Chinese writings suggest that Beijing would consider doing so through a combination of defensive measures and deterrence.

Chinese Writings on Space Defense

Because satellites are so essential to military operations, Chinese writers see an intensifying competition between ASAT technology and satellite defense. Consequently, Chinese authors write that to be prepared for space conflicts, besides having the ability to strike the enemy's satellites, it is also necessary to improve the survivability of one's own satellites. Against this background, Chinese writers discussed a wide variety of measures to enhance satellite survivability. Defensive measures mentioned in Chinese articles include signature reduction, hardening and other protective measures, electromagnetic protection, satellite mobility, improving space situational awareness, and renting foreign space systems.

Chinese journal articles indicate that one way of defending space systems is employing signature reduction techniques, which makes it more difficult for the adversary to find and attack the spacecraft [15]. According to one Chinese analyst, concealment measures can include covering the satellite with special materials to reduce its visibility to enemy radar and reducing other signatures [16]. Some Chinese writers also suggest hardening or increasing protection for key components, such as the electro-optical sensors on imaging satellites. Another defensive measure that is emphasized is the enhancement of protection against electromagnetic interference. Still others include increasing satellite mobility, discharging bait and false targets, and using distributed small satellites. In addition, Chinese analysts underscore the importance of enhancing space situational awareness to observe enemy activities in space and provide warning of any attack.

Spacecraft themselves are not the only assets that need to be defended. The protection of information links and ground stations is seen as equally essential. Chinese authors address defending information links by employing measures such as encryption and various types of anti-jamming technology. Chinese authors write that encryption makes it more difficult for the other side to collect intelligence while direct-sequence spread spectrum (DSSS), frequency hopping and related measures enhance the satellite link's anti-jamming capabilities. They also assert that to deal with computer network threats, it is very important to ensure the secrecy, validity, and integrity of one's own information systems. Defending ground support systems is also seen as vital. Measures for protecting ground elements evaluated in Chinese articles include camouflage and concealment, mobility, and redundancy.

Camouflage and concealment reduces the probability that an enemy will be able to detect and target a facility. Mobile ground support systems make it harder to find and strike Chinese assets. Redundancy enhances survivability of the system in the face of enemy attacks. Finally, one Chinese author suggests that using leased foreign space systems poses a diplomatic and political dilemma for the enemy who would otherwise want to try to attack China's space information systems. Leasing foreign space information systems "increases the attacking side's decision-making burden" because they must contemplate attacking a satellite that is owned by a third party [17].

Space Deterrence

In addition to defense, Chinese military writers also emphasize the growing importance of space deterrence. For example, Peng Guangqian and Yao Youzhi highlight space deterrence as one of the key types of strategic deterrence, placing it on par with nuclear deterrence, conventional deterrence, information deterrence, and "People's War Deterrence" [18]. Other Chinese writers contend that China is still developing its space deterrence strategy. According to Bao Shixiu, "Currently, China does not have a clear space deterrence theory to guide its actions for countermeasures." Nonetheless, he argues, the rough outlines of China's approach approximate Chinese thinking on deterrence in other areas and its overall "active defense" strategy. "The basic necessity to preserve stability through the development of deterrent forces as propounded by Mao and Deng remains valid in the context of space," Bao writes [19].

China's development of a space deterrence strategy can thus proceed from a starting point that draws on the strategic guidance of Mao and Deng and resembles Cold War deterrence theory, at least at a general level. Chinese writers, like their Western counterparts, conclude that strategic deterrence requires a country to meet three basic conditions: the possession of deterrent capabilities; the will to use them; and the ability to communicate to an adversary that it has the capabilities and the determination to use them if necessary. Yet, Bao argues that space force deterrence will differ from nuclear deterrence in some key respects. According to Bao, "[although] there will be a taboo on the use of space weapons, the threshold of their use will be lower than that of nuclear weapons because of their conventional characteristics. Space debris may threaten the space assets of other 'third party' countries, but the level of destruction, especially in terms of human life, could be far less than nuclear weapons or potentially even conventional weapons."

Within this broad context, Bao outlines a Chinese approach to space deterrence, one in which "an active defense will entail a robust deterrent force that has the ability to inflict unacceptable damage on an adversary" [20]. According to Bao, "under the conditions of American strategic dominance in space, reliable deterrents in space will decrease the possibility of the United States attacking Chinese space assets." Specifically, he writes, China "will develop anti-satellite and space weapons capable of effectively taking out an enemy's space system, in order to constitute a reliable and credible defense strategy." This suggests that in addition to denying an enemy the ability to use its space systems in a war with China and countering the possibility of space-based missile defense capabilities undermining China's nuclear deterrent, another of the missions for China's counter-space capabilities could be protecting China's own space systems by deterring an adversary from attacking them.

Outlook and Implications

As China continues to place more satellites into orbit, Chinese strategists are likely to become more interested in space defense and space deterrence, but this does not necessarily mean that their interest in attacking adversary space systems if required will be diminished. Indeed, Chinese writings on military space operations emphasize the importance of maintaining one's own freedom of action in space while denying the adversary the ability to use space assets in a conflict with China. Moreover, many Chinese analysts indicate that they perceive the US military as heavily dependent on space assets for crucial functions such as ISR, communications, and navigation and positioning. Some Chinese writers also argue that space represents a crucial U.S. vulnerability, one that must be exploited to win a future local war under informatized conditions. Chinese concerns about the potential of enemy space-based missile defense systems to undermine China's nuclear deterrence capabilities continue to provide another rationale for the development and possibly employment of ASAT capabilities [21]. Given the conviction that preventing an enemy from using space systems effectively in a conflict may very well be essential to gaining information superiority, or possibly even to preserving China's ability to launch a retaliatory nuclear strike, it seems unlikely that China's development of counter-space systems would be limited to deterring attacks against China's own satellites. Consequently, even as its interest in space defense and space deterrence increases along with the need to protect its own growing satellite capabilities, Beijing will probably still view counter-space weapons as giving it the option of denying an enemy the advantages its forces derive from unhindered access to space systems.

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Notes:

1. Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China, 2010*, 7.
2. Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China, 2010*, 36.
3. For example, see Liu Biliu, Wu Meng, Ma Yiwei, Zeng Xiaoli, and Xi Rui, "卫星面临的威胁及其防护, *Weixing mianlin de weixie jiqi fanghu*" [Threats to Satellites and their Protection], "航天电子对抗, *Hangtian dianzi duikang*" [Aerospace Electronic Warfare], 2010, No. 6.
4. On Chinese views of the importance of space in future wars, see Roger Cliff, John Fei, Jeff Hagen, Elizabeth Hague, Eric Heginbotham and John Stillion, *Shaking the*

Heavens and Splitting the Earth: Chinese Air Force Employment Concepts in the 21st Century (Santa Monica, CA: RAND Corporation, 2011), pp. 51-61; Larry M. Wortzel, *The Chinese People's Liberation Army and Space Warfare*, American enterprise Institute, October 2007, http://www.aei.org/docLib/20071017_SpaceWarfare.pdf; Ashley J. Tellis, "China's Military Space Strategy," *Survival* 49:3 (Autumn 2007), 41-72; and Kevin Pollpeter, "The Chinese Vision of Military Space Operations," in James Mulvenon and David Finkelstein, ed., *China's Revolution in Doctrinal Affairs* (Alexandria, VA: Center for Naval Analysis, 2005), 329-369.

5. For recent overviews of the development of Chinese space systems and their capabilities, see Andrew Erickson, "Satellites Support Growing PLA Maritime Monitoring and Targeting Capabilities," *China Brief* 11:3 (February 10, 2011); and Kevin Pollpeter, "To Be More Precise: The Beidou Satellite Navigation and Positioning System," *China Brief* 7:10 (May 25, 2007).

6. Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China, 2010* (Washington, DC: Department of Defense, 2010), 7, http://www.defense.gov/pubs/pdfs/2010_CMPR_Final.pdf.

7. Zhang Hui, "Space Weaponization and Space Security: A Chinese Perspective," *China Security* No. 2 (2006), 24-36.

8. Bao Shixiu, "Deterrence Revisited: Outer Space," *China Security* No. 5 (Winter 2007), 5, http://www.wsichina.org/cs5_1.pdf.

9. Bao, "Deterrence Revisited: Outer Space," 4.

10. For Chinese perceptions of U.S. activities, see Yuan Liwei, Yang Jianjun, Yang Jiahong, "美国反卫星武器纵述, *Meiguo fanweixing wuqi zongshu*" [Discussion of American Anti-Satellite Weapons], "中国航天, *Zhongguo hangtian*" [Aerospace China] 2004, No. 10.

11. See, for example, Shen Zhiqun, Zhang Chengkang, Shi Shuhai, "航天器安全防护保障探讨, *Hangtianqi anquan fanghu baozhang tantao*" [Study on the security guarantee of spacecrafts], "航天电子对抗, *Hangtian dianzi duikang*" [Aerospace Electronic Warfare], 2010, No. 1.

12. Liu, Wu, Ma, Zeng, and Xi, "卫星面临的威胁及其防护, *Weixing mianlin de weixie jiqi fanghu*" [Threats to Satellites and their Protection].

13. For example, see Zhao Xinguo, Hou Yingchun, and Cao Yanhua, "未来作战中航天指挥基本问题研究, Weilai zuozhan zhong hangtian zhihui jiben wenti yanjiu" [The Basic Issues of Space Command in Future Wars], "装备指挥技术学院学报, *Zhuangbei zhihui jishu xueyuan xuebao*" [Journal of the Academy of Equipment Command & Technology] 18:1 (February 2007), pp. 41-45.

14. See Zhang Hui, "Space Weaponization and Space Security."

15. For example, see Huang Hanwen, "卫星隐身概念研究, *Weixing yinshen gainian yanjiu*" [Concept Study on Satellite Stealth], "航天电子对抗, *Hangtian dianzi duikang*" [Aerospace Electronic Warfare], 2010, No. 6; Meng Lingjie, Zhang Xiangyi, Hou Yukui, Huang Yumin, and Liu Pinxiong, "卫星低可探测性技术发展浅析, *Weixing dike tancexing jishu fazhan huaxi*" [Low Detection Satellite Technology Development Analysis], "航天电子对抗, *Hangtian dianzi duikang*" [Aerospace Electronic Warfare], 2010, No. 1; and Qi Xianfeng, "空间信息系统防护探讨, *Kongjian xinxi xitong fanghu tantao*" [Study on the Protection of Space Information Systems], "装备指挥技术学院学报, *Zhuangbei zhihui jishu xueyuan xuebao*" [Journal of the Academy of Equipment Command & Technology] 2005, No. 5.

16. Zhang Liying, Zhang Qixin, Wang Hui, "反卫星武器技术及防御措施浅析, *Fan weixing wuqi jishu ji fangyu cuoshi qianxi*" [An Analysis of ASAT Weapon Technology and Defensive Counter-measures], ", 飞航导弹, *Feihang daodan*" [Winged Missiles Journal] No. 3 (March 2004).

17. Qi Xianfeng, "空间信息系统防护探讨, *Kongjian xinxi xitong fanghu tantao*" [Study on the Protection of Space Information Systems].

18. Peng Guangqian and Yao Youzhi, ed., *The Science of Military Strategy* (Beijing: Military Science Publishing, 2005), 217-223.

19. Bao, "Deterrence Revisited: Outer Space," 6.

20. Bao, "Deterrence Revisited: Outer Space," 9.

21. For concerns about the possibility that space-based missile defense could neutralize China's nuclear deterrent, see Hui Zhang, "Chinese Perspectives on Space Weapons," in Pavel Podvig and Hui Zhang, ed., *Russian and Chinese Responses to U.S. Military Plans in Space* (Cambridge, Mass.: American Academy of Arts & Sciences, March 2008), 31-77, http://belfercenter.ksg.harvard.edu/files/militarySpace.pdf.

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