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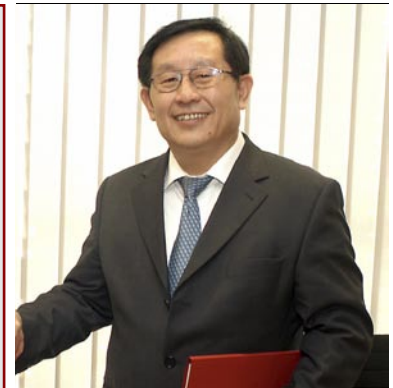
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In a Fortnight

By Joseph E. Lin

BEIJING DEFENDS ITS ACTIVITIES DURING AFRICAN DEVELOPMENT BANK MEETING

Reflecting China's increasing economic ties and growing political influence within Africa, the May 16-17 annual meeting of the African Development Bank (ADB) is currently being held in Shanghai, only the second time that an ADB meeting has been held outside of Africa (the first was in Spain in 2001) and the first held in Asia. The two-day meeting is being attended by some 2,000 individuals, including finance ministers and central bank officials from more than 50 member countries (Xinhua, May 16, 2007). Three African heads of state—President of Rwanda Paul Kagame, President of Cape Verde Pedro Pire and President of Madagascar Marc Ravalomanana—are also attending the annual meeting and will hold summit talks with the Chinese leadership during their visit to China.

China, which has been an ADB member since 1985, has been sensitive to recent Western and African accusations of engaging in neocolonialist behavior, stripping the continent of its resources in return for little substantial developmental assistance, and has sought to use the annual meeting as an opportunity to demonstrate its good intentions. Countering China's critics, Chinese Premier Wen Jiabao stated during the opening ceremonies, "We are truly sincere in helping Africa speed up economic and social development for the benefit of the African people and its nations" (*China Daily*, May 16). Wen also reiterated Beijing's willingness to fulfill the promises of aid and assistance that Hu had pledged during the Forum on China and Africa Cooperation (FOCAC) Summit in November 2006. "We will fully deliver on our

statement,” Wen emphasized, “and we are working with African countries to implement these measures,” which include the doubling of Chinese aid to Africa by 2009 and the creation of a \$5 billion investment fund.

TAIWAN LAUNCHES ANNUAL HAN KUANG 23 MILITARY EXERCISES

On May 15, Taiwan launched its annual Han Kuang (Han Glory) live-fire exercises that are meant to test the island’s defense capabilities and its ability to conduct counterattacks against military actions by China. The exercise began with six fighters—two F-16s, two Mirage 2000-5s, and two Indigenous Defense Fighters (IDFs)—conducting an emergency landing on a stretch of the Sun Yat-sen Freeway. Once the planes landed, ground crew equipped them with missiles and bombs before they took off an hour later (CNA, May 16). The drill, meant to simulate a scenario in which Taiwanese air bases were destroyed by a barrage of Chinese missiles and bombs, is the second such exercise in three years. The following day, the Taiwanese Navy conducted its first live-fire test of the U.S.-made Standard-II surface-to-air missile, which was launched from a Kidd-class destroyer, while the Army launched the indigenously developed Hsiung Feng II and U.S.-made Sparrow missiles (AFP, May 16). Some 120,000 soldiers and 23,000 reservists are expected to participate in the four-day exercise, which are to include drills against Chinese airborne and special forces assaults on Taiwan’s offshore islands and harbors as well as a counter-landing exercise in Pingtung County in southern Taiwan. The annual drills are attended by a U.S. delegation of military and civilian officials who serve as unofficial advisors to the Taiwanese military. This year’s delegation is led by retired Admiral Dennis Blair, who previously served as the commander of the U.S. forces in the Pacific.

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Hu Jintao Battles the CCP’s Crisis of Confidence

By Willy Lam

The Chinese Communist Party (CCP) is undergoing its worst crisis of confidence since the Tiananmen Square crackdown 18 years ago. While President and CCP General Secretary Hu Jintao is currently preoccupied with the means by which to consolidate the power of his faction at the upcoming 17th Party Congress, a loss of faith in the party as well as a dramatic decline in probity and old-style “combat-readiness” has hit the nation’s 71 million party members. Yet, even as a number of retired cadres have proposed relatively radical solutions to these woes, such as the suggestion that the CCP gradually transform itself into a Western European-style socialist democratic party (SDP), Hu has instead chosen to implement Maoist-era ideological campaigns to revive the party’s fortunes.

Party morale has deteriorated to such a degree that even official mouthpieces have admitted that the quality of CCP members has declined to new lows. The journal *Qiushi* (“Seeking Truth”) noted earlier this month that some within the party “believe in gods and ghosts rather than Marxism-Leninism and they put their faith in personal [connections] rather than the collective.” The journal also stated that for an unspecified number of CCP officials and members, “their loyalty regarding the party’s nature, goals, programs and road-maps has become attenuated,” while others had become “decadent and degenerated, and [have engaged in] corrupt and illegal activities” (*Qiushi*, May 2007). The recent bullish growth in the Shanghai and Shenzhen stock markets has reinforced the mentality—prevalent among CCP members as well as among the public—of “looking at everything with only money in mind.” Moreover, the party’s disciplinary and anti-graft offices are investigating a record number of cases in which official funds have been diverted toward “playing the bourses”—the crime allegedly committed by former Shanghai Party Secretary Chen Liangyu and his associates.

President Hu’s response to this crisis of faith and confidence has been to recycle ideological movements formulated by his large group of political commissars and propaganda specialists. In 2004 and 2005, cadres of all levels were required to sit through weekly ideological classes on “how to uphold the advanced nature of a Communist.” The latest indoctrination sessions have centered on the so-called “education about the Three Consciousness.” This is a reference to Hu’s dictum that party cadres and members must raise “their consciousness of living in dangerous times, their sense of duty as public servants, and the virtue

of thriftiness.” While talking to officials in Beijing and the provinces, Hu has stressed that party members must “further boost their awareness of [impending] hardships and dangers” and that they should “exemplify the spirit of ‘plain living and hard struggle’” (Xinhua, March 9). Indeed, during his four-and-a-half-year-old administration, Hu has conducted more propaganda campaigns than did former President Jiang Zemin—usually deemed more conservative than Hu—during his 13-year tenure.

Hu and Premier Wen Jiabao have also tried to purify the party by introducing several regulations with regard to moral standards, anti-corruption practices and politically correct behavior. For example, numerous statutes and codes have been issued forbidding the spouses, children and relatives of senior cadres from going into business. Late last month, Wen unveiled yet another set of penalties for cadres and civil servants who have run afoul of not only the law but also commonly accepted moral precepts. According to the new regulations, officials who have failed to render support to their ailing parents, or who have acquired “second wives” will be censured, and in serious cases, sacked (Zhongguo Xinwenshe, April 30). Earlier stipulations had already barred party cadres and civil servants from gambling, visiting nightclubs and bathhouses and worshipping in temples or churches.

The apparent failure of Hu and Wen to improve the quality and rectitude of CCP cadres and members has resulted in bold calls for the party to make a clean break with the past. The retired vice-president of the People’s University, Xie Tao, created a stir in the spring when he noted in a party journal that “the CCP’s only way out is through [embracing] democratic socialism” of the West European variety. “Only constitutional democracy can fundamentally solve the ruling party’s problems of corruption and graft,” he wrote in the respected journal *Yanhuang Chunqiu* [Across the Ages]. “Only democratic socialism can save China.” Xie cites Switzerland as a model for a largely egalitarian society with adequate welfare benefits as well as full protection of the rights of workers and farmers (*Yanhuang Chunqiu*, February 2007). After all, the central plank of the Hu-Wen administration’s “putting people first” platform is precisely raising the socioeconomic standards of the country’s disadvantaged classes, a goal that has remained illusory so far.

In a similar vein, Chairman Mao’s one-time secretary Li Rui has openly called for the adoption of Scandinavian-style democratic socialism. Li, one of President Hu’s early mentors, said he agreed with late patriarch Deng Xiaoping that most party members were not even sure what socialism meant. “Yet we can be sure of one thing,” Li wrote recently. “Socialism cannot do without democracy; and it

cannot do without rule of law” (*Wenzhai Bao*, February 17). Like-minded professors and retired officials have also “resurrected” the sayings of liberal icons such as deceased CCP General Secretary Zhao Ziyang and the former head of the CCP Propaganda Department Lu Dingyi. Articles and talks by Zhao and Lu relating to comprehensive political reform, or at least allowing the people to speak freely, are being circulated on websites or blogs that have eluded the censors thus far.

Xie, Li and other liberal intellectuals have quite a few things in common. First, they are mostly second- and third-generation cadres who joined the CCP much earlier than did either Hu or Wen. While Hu has used draconian methods to prevent the pro-Western views of young or middle-aged intellectuals from emerging into the public sphere for debate, the president is forced to tolerate these occasional outbursts from the Long March veterans. Moreover, these progressive elders are not organized politically. They are not linked with political organizations or non-governmental organizations abroad, thus denying the authorities any pretext to silence them.

Therefore, to stem the tide of “bourgeois liberalization,” the propaganda and censorship establishment under senior Politburo member Li Changchun has given carte blanche to the party’s “leftists,” or remnant Maoists, to attack the likes of Xie and Li Rui. This is despite the fact that Hu and Li Changchun had clashed with the leftists only last year—and used means that included the closing down of a few of their websites—when these arch-conservatives attacked the Hu-Wen leadership for allowing private and foreign capital to purchase state assets and “exploit” Chinese workers. Since Xie’s article was released in February, leftist research institutes associated with the former director of the CCP Propaganda Department Deng Liqun have held four conferences to savage Xie for his “wholesale betrayal of Marxism and socialism.” The conservatives have also rallied behind prominent individuals, such as the former director of the CCP Organization Department, Zhang Quanjing. In a widely circulated article, Zhang charged that Xie had “openly gone against the state constitution and the party charter.” Zhang added that Xie’s article had made not only “political mistakes,” but also errors not befitting the former professor’s status as a senior retired cadre (*Gongnong Zhisheng*, April 9).

Yet, to convince the world of the CCP’s pro-reform inclinations, the Hu-Wen team has rushed through various measures in the period leading up to the 17th Congress in the fall. Last month, party and state authorities appointed Professor Wan Gang, a non-CCP member, to serve as the minister of science and technology (*Shanghai Daily*, April 28). This is the first time since the 1950s that a non-

party member has been given a ministerial-level job. The leadership has also elevated several so-called “returnees,” or Chinese with Western post-graduate degrees, to top positions. Wan received his doctorate in Germany, and the new Foreign Minister Yang Jiechi studied in London for a few years. Moreover, through calculated leaks to the foreign and Hong Kong media, members of Hu’s personal think tanks have suggested the possibility of significant political reforms at the 17th Congress. There has been speculation, for instance, that the size of both the Politburo and the Central Committee would be slightly expanded to accommodate more sectors of the population, especially the fast-rising business community.

Liberal intellectuals who are disappointed by President Hu’s perennial foot-dragging on reform point to the fact that a few years before he became the head of the CCP, the then vice-president had demonstrated considerable interest in the socialist democratic party (SDP) model. Hu, who was also the president of the Central Party School at the time, had assembled a team of researchers to study the ideology and organization of a number of European SDPs. A retired party cadre noted that Jiang Zemin, Hu and current Vice President Zeng Qinghong have toyed with the idea of borrowing individual elements of the SDP model. Discussion on this topic among members of official think tanks petered out by 2003, however, and Hu is known to have privately scolded the likes of Xie Tao and Li Rui for “adding confusion to the political climate.” Political observers fear that if Hu and his associates remain single-mindedly focused on boosting the political fortunes of their own factions, the largest and richest political party in the world would degenerate into a hodge-podge collection of cabals interested only in power, perks and prerogatives, and little else.

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To Be More Precise: The Beidou Satellite Navigation and Positioning System

By Kevin Pollpeter

China’s launch of its fifth navigation and positioning satellite in April 2007 reaffirms its commitment to establishing an increasingly capable satellite navigation and positioning system able to compete with the U.S. Global Positioning System (GPS). Called Beidou, but sometimes referred to as the Compass Navigation Satellite System, China’s current system consists of five satellites that provide regional coverage of China and surrounding areas.

China began researching satellite navigation and positioning technologies in the 1960s, and after a hiatus brought on by the Cultural Revolution, research was restarted in the late 1970s. In 1983, a plan for a satellite navigation and positioning system under the name “Double Star Rapid Positioning System” was developed (www.china-spacenews.com, January 7, 2006). Chen Fangyun, an 863 Project founder, later proposed a two-satellite Radio Determination Satellite Service (RDSS) system that was formally approved for development in 1994 [1]. The first Beidou satellite was launched in 2000 with two more satellites launched in 2003, which formed the first generation of a constellation all in geosynchronous orbit. Two additional satellites have been launched in 2007.

TECHNOLOGY

The Beidou system is based on the now defunct U.S. Geostar system, which is dissimilar to GPS. Beidou is a RDSS providing regional coverage that requires two satellites, a centralized earth station, mobile terminals and a subscriber station where transmitted data is delivered. In contrast, GPS is a constellation of 24 satellites, which provides global coverage and does not require a centralized earth station. The biggest difference in performance is in accuracies and communications. While GPS can provide accurate positions of within a few meters, the accuracy of Beidou is 20 meters with the use of calibration points and 100 meters without calibration.

In addition, unlike GPS, Beidou can also provide two-way communication between a client’s mobile terminals and headquarters. Customers can transmit up to 120 characters at a time using Beidou. The primary application for Beidou is in the transportation industry. Using a RDSS system, a trucking company can obtain a nationwide inventory of its trucks and past records of truck routes. RDSS systems

can also be used to monitor a vehicle's performance or to monitor changes in the vehicle, such as door locks or acceptable temperature ranges of a refrigerated truck, which can be used to warn of vehicle theft or malfunction. An emergency function can also be used to alert clients of an accident or a crime in progress. In areas with poor coverage, the Beidou signal can be supplemented with GPS.

APPLICATIONS

China has developed the Beidou system for both military and civilian uses. In this regard, China is following the lead of the United States in developing a system that is at its core a military system, but will also serve a variety of civil and commercial applications. The main concern for China is that GPS can be turned off or degraded by the United States in the event of conflict. Consequently, China's national interests require access to a satellite navigation and positioning system that is independent of foreign operation. Ultimately, China wants to develop Beidou such that it is on par with GPS in both operation and capabilities.

The importance of satellite navigation and positioning for military and civilian applications has not been lost on the People's Liberation Army (PLA) or Chinese commercial interests. The use of GPS for navigation and precision guided bombing by the U.S. military has been demonstrated by its indispensability in fighting "informationized" warfare. Precision guided bombing is especially important in the case of a conflict with Taiwan in which China would want to avoid indiscriminate bombing so as not to alienate the Taiwanese public. The PLA also uses the two-way communication function of Beidou to communicate with units and to monitor their positions (*Jiefangjun Bao*, June 4, 2006). Satellite navigation and positioning can also be used by China's increasingly capable submarine force that can receive the signal without surfacing. The PLA Navy's next generation of ballistic missile submarines could use Beidou for more precise positioning data that could be entered into the guidance system of the missiles before launch. In fact, the first satellite navigation and positioning system, Transit, was developed for the U.S. Navy for this purpose. Chinese authors have also explored the use of satellite navigation and positioning for use in the guidance systems of ballistic missiles [2].

The growing market for GPS applications has also drawn interest in developing Beidou for commercial use. It has been estimated that the global GPS market will increase to \$22 billion by 2008 (*Directions Magazine*, October 2, 2003). Obvious applications include those used in the transportation industry and individual automobiles, but

applications are also being used by commercial entities for its precision timing. GPS is used for the synchronization of wireless and telecommunications networks and in the measurement and monitoring of power transmission systems.

FUTURE SYSTEMS

To capitalize on most of these applications, Beidou will have to be improved upon. Its relatively imprecise positioning and timing data are insufficient for true precision bombing and accurate navigation and timing. Chinese authors recognize this and admit that Beidou is unable to satisfy China's future satellite navigation needs, but defend it as a system built with little investment that is performing to specification. Chinese authors write that if China is to meet the technical challenges of the twenty-first century, it must field a more capable satellite navigation and positioning system by following the United States' lead and develop a system that primarily serves military purposes but also remains fully useable by civilian sectors [3].

To this end, six academics from the China Aerospace Science and Technology Corporation argued in early 2005 in a document entitled "Suggestions for Improving Beidou Satellite Navigation Applications," that satellite navigation and positioning systems required full government support and that no single organization could overcome insufficient funding no matter how hard they worked. The document came to the attention of the State Council and in September 2005, the National Development and Reform Commission and COSTIND issued the document "A Notice Concerning Increasing the Promotion of the Relevant Work of Beidou Navigation Applications" which stipulated that Beidou would be classified as a part of the national basic construction plan and receive sufficient funding. This document also stated that in order to promote Beidou applications, the government should begin demonstration applications of Beidou, support the industrialization of ground terminals, establish and support stable long-term mechanisms for civilian users, set up standards for the timing signal of Beidou, conduct overall planning for the development of component parts and localize the production of receivers [4].

There are conflicting reports about the exact nature of future Beidou constellations. China's present configuration of five satellites appears to have been put in place to guarantee service for the Olympics since the first three satellites may be near the end of their service life (*www.spacechina.com*, February 3). Beyond that, Chinese press reports have stated that the second generation of Beidou will consist of four geostationary satellites, 12 medium earth orbiting satellites and nine high earth orbiting satellites and will

achieve global coverage by 2010 [5]. More recent reports have stated that the system will consist of five geostationary satellites and 30 medium earth orbiting satellites, but do not give a timetable (*Xinhua*, November 13, 2006). Another press report states that China has registered 36 satellite slots with the International Telecommunications Union for Beidou, of which fourteen will be in geosynchronous orbits and 22 in medium earth orbits (*SatNews Daily*, April 16). Regardless of the number of satellites, the second generation Beidou will only be capable of achieving accuracies of 10 meters, still much less accurate than GPS.

Conflicting accounts also exist over the exact nature of services to be offered. According to many press reports, China will offer the Beidou navigation and positioning services free of charge. Another article, however, states that China will offer an “open” level of service as well as a second level of service that will offer “authorized” positioning, velocity and timing communications service (*Xinhua*, November 13, 2006). The biggest difference of the second generation of Beidou satellites will be its similarity to GPS. China plans to eliminate the centralized earth station, which could serve as a target for U.S. military operations, and have it function much like the GPS system with the use of satellites and client terminals [6]. Eventually China hopes to achieve GPS-like accuracies with Beidou [7].

China boasts that the Beidou system does have its own advantages. These include the ability to facilitate communications between subscriber headquarters and mobile terminals and that it is indigenously made. Beidou supporters also argue that the potential for the U.S. military to turn off or degrade the GPS signal means that Chinese customers must depend on a more reliable form of navigation and positioning services.

MARKET POTENTIAL

Despite these advantages, use of the Beidou system has lagged behind GPS usage. The Chinese navigation and positioning services market has been expanding in recent years. In 2002, it was estimated at 3.95 billion yuan (\$514 million) and in 2003, it was estimated at 7 billion yuan (\$900 million) [8]. These numbers are expected to increase. Less than two percent of the country’s automobiles, for example, are equipped with a satellite navigation and positioning system, indicating that the market remains largely untapped. Chinese market analysts are hopeful for Beidou’s prospects and estimate that there will be 300,000 Beidou users in 2008 with a market value of 3.5 billion yuan (\$455 million) constituting about 20 percent of the total Chinese market for satellite navigation and positioning services [9].

It is uncertain if Beidou service providers will be able to meet this projection, however. GPS receivers in China cost 3,000-6,000 (\$390-780) yuan, while Beidou receivers are a whopping 20,000-30,000 yuan (\$2,600-3,900) [10]. The discrepancy in prices is attributed to a low customer base and the necessity of receivers to provide both location data and two-way communications [11]. Moreover, considering the eventual demise of Geostar and the advent of similar systems using GPS and cellular communications to provide many of the same features as Beidou, it is uncertain if providing satellite-based two-way communications will be viable.

TECHNOLOGY GAPS

Moreover, China has yet to master most of the technologies needed to indigenously develop a satellite navigation and positioning system and must even concentrate on basic components such as microchips and circuit boards before it can do so [12]. China’s 200 million Euro (\$280 million) investment in the Galileo satellite navigation and positioning project, for example, is an implicit recognition on the part of the Chinese government that the independent development of these technologies will be difficult. In February 2006, the China Astronautics Association Satellite Application Work Committee held a “China Beidou Navigation System Application Forum” that advised the government to develop a new generation of navigation and positioning satellites by replacing the “Made in China” concept with the concept of “Innovated in China,” replacing foreign components with domestic components (www.spacechina.com, February 10, 2006).

China appears to have far to go before it can bring this goal to reality. A critical component of navigation and positioning satellites is timing technology. GPS, for example, uses very precise atomic clocks to perform its calculations. China, on the other hand, lacks atomic clock technology that can survive the harsh space environment. To compensate, China has purchased rubidium atomic clocks from the Swiss company Temex. These clocks are three times less accurate than the clocks to be used on the Galileo satellites. According to one source, China has been working on atomic clock technology since 2000 with limited results, but may close the gap in three to four years (*Space News*, June 19, 2006).

CONCLUSION

China’s development of the Beidou navigation and positioning satellite system holds the possibility that China will develop a viable competitor to GPS. Yet, when this may occur is uncertain. China’s inability to develop technologies that are precise enough and the proposed 10-meter accuracy

of the second generation Beidou indicate that it may be some time before it can match GPS on performance. In addition, because GPS services are so ubiquitous and the signal free of charge it is not apparent what comparative advantage Beidou possesses, besides being made in China and free from U.S. control. Given these hurdles, GPS will likely remain the best satellite navigation and positioning service for many years to come.

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NOTES

1. The 863 Program is China's premier high technology research and development funding source. Shan Bian, "China's Satellite Navigation System – The Beidou Navigation and Positioning System [Zhongguo de weixing daohang xitong – beidou daohang dingwei xitong]," *China Surveying and Mapping News* [Zhongguo cehui bao], August 17, 2004.

2. See, for example, Kang Guohua, Liu Jianye, Xiong Zhi, and Zhu Yanhua, "GNSS/SST/SINS Integrated Navigation System for Ballistic Missile [DaodandandaoGNSS/SST/SINS zuhe daohang xitong yanjiu]," *Geomatics and Information Science of Wuhan University* [Wuhan daxue xuebao – xinxi kexueban], February 2006 p. 176-179.

3. Tong Kai, "China's Progress in Navigation and Positioning Satellite Systems [Zhongguo daohang dingwei weixing xitong de jinzhan], *Aerospace China* [Zhongguo hangtian], August 2002.

4. "Beidou Navigation Applications Reach a Critical Stage [Beidou daohang yingyong jinru guanjian jieduan]," www.spacechina.com, February 10, 2006.

5. Zheng Di, "'Beidou System' Commercial Application Layout: China Satellite Navigation Breakthrough GPS [Beidou xi'shang yong buzhen zhongguo weixing daohang tuwei GPS]," *21st Century Economic Report* [21Shiji jingji baodao], April 25, 2005.

6. Tong Kai, "China's Progress in Navigation and Positioning Satellite Systems.

7. Xie Jinshi, "Several Issues Concerning Our Country's Satellite Navigation and Positioning System Construction and Development Process [Wogou weixing daohang dingwei xitong jianshe yu fazhan guocheng zhong yingzhuyi de jige wenti], *Aerospace China* [Zhongguo hangtian], September 2005.

8. Yang Jun and Zhou Ruxin, "Our Country's Satellite Navigation Application Market Analysis [Wogou weixing daohang yingyong shichang fenxi], *GNSS World of China* [Quanqiu dingwei xitong], May 2003, p. 46.

9. Shan Bian, "China's Satellite Navigation System – The Beidou Navigation and Positioning System.

10. Shi Lei and Hu Qunfang, "Beidou Applications Drives On the Expressway Early [Beidou yingyong zao ri shiru kuaichedao]," *China Space News* [Zhongguo hangtian bao], April 22, 2005.

11. "Beidou Navigation System Faces the Market's Final Exam [Beidou daohang xitong zhimian shichang dakao]," *China Space News* [Zhongguo hangtian bao], October 1, 2003, p.1.

12. Tong Kai, "China's Satellite Navigation and Positioning System [Zhongguo de weixing daohang dingwei xitong], *Commlit* [Xiandai junshi], October 2003, p. 9-10.

Flowing Downstream: The Sino-Kazakh Water Dispute

By Sebastien Peyrouse

Within the current Sino-Central Asian rapprochement, the issue over water rights and management has become an important factor in regional cooperation, but also a source of increasing contention. Kazakhstan and China share some 20 transboundary rivers. Two of Kazakhstan's main rivers, the Ili and the Irtysh, originate in China, the former in the Tian-Shan Mountains and the latter in the Chinese Altay Mountains. China has recently extracted increasing amounts of water from both rivers upstream of the border. Such extractions have adversely affected Kazakhstan's agricultural and industrial development and could even influence regions as far away as Siberia, since the Irtysh is the main tributary of the Ob River, which traverses the Omsk region. In preparation for the upcoming August Shanghai Cooperation Organization (SCO) summit in Bishkek, Kyrgyzstan, this question resurfaced for some weeks on the public stage in Kazakhstan, which is concerned about the degradation of the ecological systems and economic industries linked to the two rivers. The rapidly developing cooperation between China and Kazakhstan should, however, enable both parties to find an acceptable solution to this strategic issue.

CHINESE OBJECTIVES

With the rapid expansion of its economy, China is confronting a human development challenge that could potentially destabilize varying regions. China recently reaffirmed its objective of developing the "Far West" (*xibu dakaiifa*) as one of its main economic and policy issues for the coming years. Indeed, Beijing has placed much hope in developing western China's agriculture industry, particularly cotton, which occupies close to half of Xinjiang's arable land. Cotton production has become a key factor in the Chinese economy, and Beijing considers the massive exportation of

textiles to be of vital strategic interest. China also seeks to augment wheat production in the autonomous Kazakh region of Xinjiang. This production is forecast to double to five million tonnes per year. To this end, new fields will require additional water supplies, which can only come from the Ili and Irtysh Rivers.

With constant decreases in the deposits of the northeast, Beijing also seeks to exploit the region's petroleum resources. Xinjiang is believed to be home to more than a quarter of the country's petroleum and gas reserves and is set to become the energy center of China in a few years. China is looking to attain production levels of 35 million tonnes of petroleum per year, which should satisfy more than a fifth of Chinese demands by 2010. The Urumqi and Lanzhou refineries will directly benefit from this appreciable increase in the petroleum supply; and the Tarim gas fields would—once the pipelines presently under construction are completed—service Shanghai. This economic development has favored urban growth in the Tarim and Turpan regions, and the emerging towns in them have only continued to increase their water consumption.

In order to successfully complete these projects, Beijing has decided to increase the amount of water extracted from the Ili and Irtysh Rivers. In the 1990s, China announced the construction of the 300 kilometer-long and 22 meter-wide "Kara Irtysh-Karamai" canal, intended to redirect between 10 percent and 40 percent of the Irtysh to Ulungur Lake. The objective is twofold: first, to irrigate 140,000 new hectares of agricultural fields; and, second, to transport water to the Karamai oil fields, situated about 400 kilometers from Urumqi, with confirmed reserves of 1.7 billion tonnes of oil [1]. The canal reached completion in 1999. Currently, it diverts around 500 million cubic meters of water per year, but the figure should reach more than a billion cubic meters when it reaches its operating capacity in 2020. In October 2004, the Chinese ambassador to Kazakhstan, Pei Shouxiao, recognized the project's incredible significance, and affirmed that his country was counting on using as much as 40 percent of the Irtysh's effluence (*Eurasia Daily Monitor*, June 30, 2005).

ECONOMIC AND ECOLOGICAL RISKS IN KAZAKHSTAN

Kazakhstan, however, is less enthusiastic about China's enormous consumption of water from these sources and is concerned about the falling level of these rivers in its territory, since it also requires a large amount of water to support its economic development. The Ili feeds into the Kapchagai hydroelectric station, which supplies energy to the south of Kazakhstan, an area that experiences considerable energy shortfalls. A reduction in its effluence would result in an almost automatic increase in electricity

prices, which by the country's standards are already relatively high. As for the Irtysh, it is navigable from April to October and is one of the chief motors driving commercial exchange between this part of Kazakhstan and the Russian town Omsk. In addition, the country lacks water for agriculture: close to 15,000 square kilometers of arable land earmarked for cotton production has not been developed in Kazakhstan due to the lack of water. Rice production has also decreased, supposedly because of the drop in river levels. According to the Kazakh government, the Irtysh is the main source of water for around four million out of the country's total population of 15 million people (*Asia Times*, June 5, 1999).

Important towns of the northeast, such as Karaganda, Semipalatinsk and Pavlodar, all have a supply of fresh water coming directly from the Irtysh. The development of the capital Astana also requires greater provisions of water. Therefore, in order to meet the demands of the new capital, the authorities want to divert part of the Irtysh-Karaganda canal to supplement the Ishim, the Irtysh's main tributary, which supplies and flows through Astana (*Kazakhstanskaia pravda*, January 16, 2001). In addition to threatening urban development in Kazakhstan, the drop in the river's level also impairs its industrial potential. Many sites in the northeast have significant hydraulic consumption that relies on the effluence of the Irtysh. There are three hydroelectric stations in the region—one in Bukhtarma on Lake Zaisan, one in Ust-Kamenogorsk and one in Shulbinsk—all of which depend on reservoirs constructed during the Soviet era.

In addition to these economic arguments, Kazakhstan—with the backing of international environmental organizations—is concerned about the potential ecological risks accruing from China's upstream extraction of water. A reduction in the effluence of the Irtysh would mean a degradation of the entire region's ecosystem, which is already fragile, since the river also carries nitrates and petroleum products in addition to several heavy metals [2]. If this situation worsens, it could cause significant damage to Lake Zaisan, which, according to some sources, would be threatened with extinction [3]. A reduction in the effluence of the Ili would have even more serious consequences. Between the Chinese border and Lake Balkhash, the Ili is the chief source of irrigation for the fields lining the length of the Grand Almaty canal and is crucial to rice growing in the Akdalinsk region. Similarly, though it provides the lake with more than 50 percent of its water supply, by the time it reaches the Balkhash, the Ili already carries a large number of agricultural chemical pollutants.

Lake Balkhash was already ecologically damaged in the 1960s and 1970s with the construction of the Kapchagai

reservoir. The 15th largest in the world, the lake plays a key role in maintaining the climatic balance of the southeast and Central Kazakhstan. Regular increases in the lake's salinity, however, adversely affect its fresh water levels. (The lake in fact has the peculiarity of being divided into two parts, the western part being made up of fresh water, the eastern part of salt water.) Moreover, with the combination of dropping water levels, a deteriorating ecosystem, a reduction in the number of fish species and declining fishing yields, the living conditions of the local population have been detrimentally affected. The UNDP has raised the alarm, warning that the fall in the water supply from the Ili to the Lake "could become an environmental tragedy comparable to the Aral Sea disaster" [4]. If river levels continue to drop, the ensuing climatic transformation of the region could become irreversible.

DIFFICULT NEGOTIATIONS BETWEEN UNEQUAL PARTNERS

The use of water resources is poorly regulated by international treaties. States in conflict are therefore unable to appeal to specific juridical definitions and international obligations [5]. Despite its official declarations about the importance of regional negotiations, on this water issue, Beijing has chosen to rely upon bilateral discussions with its Central Asian neighbor in order to capitalize upon the disparity in political weight between the two countries.

The water issue was placed on the negotiating table when Kazakhstan achieved independence. The problem was initially raised by the first Kazakh ambassador to Beijing, Murat Auezov, though he did not succeed in drawing the attention of the Chinese authorities [6]. Kazakhstan then attempted to convince Russia to take an interest in the problem, pointing to the dangers that exploiting the two rivers would have for the Omsk region, since the Ob River depends on the Irtysh. Yet, Moscow has preferred, at least in the first instance, not to involve itself in tripartite negotiations. Then, in 1998, the Kazakh press became concerned about the construction of the "Kara Irtysh-Karamai" canal and published several alarmist articles about it. The threat of souring diplomatic relations between the two countries eventually compelled Beijing to consent to negotiations with Kazakhstan in order to solve the problem. Five rounds of official negotiations at various levels were organized in 1999, 2000 and 2001 [7].

Both countries finally signed a framework agreement for the protection and utilization of transboundary rivers in Astana on September 14, 2001 [8]. Nevertheless, the document does not stipulate any rules for the specific treatment of the Ili or the Irtysh, going no further than calling for a "measured" utilization of common waters. Beijing has systematically refused to erect a joint authority

for managing the Irtysh, accepting only the creation of a Sino-Kazakh consultative commission, which has now met only on a few occasions, first in October 2003 in Beijing, then in October 2004 in Almaty, and again in October 2005 in Shanghai. Toward the end of 2006, the commission completed a draft agreement concerning the dissemination of information about water quality to be done by each party—the document has been submitted to Beijing for approval (*Kazakhstan Today*, November 3, 2006). The fundamental stakes of extracting water from these two rivers, however, are not mentioned in any of the official texts signed by both nations or by the Commission (*Eurasia Insight*, November 24, 2004). The problem has therefore yet to be properly addressed. This is in spite of Kazakhstan's agreement in 2001 to yield to China an additional 300 square kilometers of land so that Beijing could ensure its control over the watershed of the Kara-Irtysh, something it did even though the border treaties of 1996 and of 1997 supposedly resolved all territorial issues.

As long as the negotiations remain bilateral, Kazakhstan will have difficulties in making itself heard. The Kazakh authorities remain domestically vulnerable to criticisms over their political opposition on the transboundary rivers issue, and China's attitude reinforces already prevalent concerns within Kazakh society about its intentions in the region. It is, however, possible that Russia will become more involved in the debate. Since 2004, President Vladimir Putin has seconded Astana's proposal to set up a tripartite commission, and several regional governors, including that of Omsk, raised the issue repeatedly throughout 2005 and 2006 [9]. It is equally likely that negotiations will be held within the framework of the SCO, possibly during the discussions scheduled for the summer of 2007. To the extent that regional cooperation on economic issues develops, the issue of finding ways to regulate conflicts linked to cross-border rivers will only resurface in increasingly acute fashion. The shared interest both countries have in joint hydroelectric projects demands that they find a mode of regulating the issue that does not penalize either the economic development of Kazakhstan, or that of Xinjiang, and helps to prevent the emergence of strong Sinophobic currents in Kazakh society.

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Guarding the West: China's New Mechanized Infantry Division

By Martin Andrew

The role of Xinjiang and Tibet as both suppliers and conduits of resources necessary for China's continued economic growth has resulted in a reevaluation of both regions' importance. Xinjiang, with its domestic oil fields in the Tarin Basin and its role as a hub for oil and gas pipelines arriving from Central Asia, has become China's main source of non-seaborne petroleum (*China Daily*, February 26, 2004). Tibet, on the other hand, possesses large amounts of zircon, chromium, rutile, magnesium and titanium that are needed by China's heavy industries [1]. Large amounts of cobalt and copper also lie astride the Qinghai-Tibet Railway. The strategic value of these regions and their resources has resulted in the increased deployment of China's offensive mechanized forces to these regions in order to prepare for any contingencies that

might threaten its interests.

Coinciding with these deployments has been an evolution in the content of the doctrinal discussions among People's Liberation Army (PLA) strategists. The 1980s focus on "informationized warfare" has since shifted toward the concepts of "peishu" and "zhichi." *Peishu*, translated as "attaching troops to a subordinate unit," is the concept of creating independent battle groups within a division or seamlessly augmenting a division with heavier forces. *Zhichi* or "to support" is the idea that a battlefield logistics unit should be capable of supplying and supporting forces deep inside enemy territory. Such operational doctrine in the PLA is firmly designed for broad sweeping operations as envisaged by the Soviet operational art theorists who had taught the original PLA generals in the 1920s and 30s.

ADOPTING A NEW STRUCTURE FOR THE MODERN BATTLEFIELD

The PLA has moved toward the creation of an armor-heavy corps akin to the Soviet Operational Maneuver Groups of the 1980s. The cost of such formations are enormous, however, and the PLA has started on a smaller-scale with a lighter force for deployment in Xinjiang and Shenyang that can be augmented with more powerful forces using the building block approach [2]. This permits units within and from outside of the division to be seamlessly added to augment the division's firepower or logistics capabilities. In recent years, mechanized infantry divisions under the Beijing and Shenyang Military Region (MR) Commands have conducted exercises, developing the use of units as "building blocks" to create battle groups with greatly improved operational logistics. Furthermore, along with units in Xinjiang, these forces were used to develop the PLA's new high altitude and urban warfare doctrines.

China's new mechanized infantry division, developed from these trials, was recently unveiled and has been described as being two generations ahead of current mechanized infantry divisions. Organized and equipped to fight as independent battle groups specifically on mountainous and urban terrain, its equipment is lighter in weight and firepower than the PLA's armored and tank divisions tasked to defend the nation. Its theaters of operation include Xinjiang and Tibet where the division's lighter vehicles and support weapons can operate in areas where the communications infrastructure is described as underdeveloped at best.

The structure of the armored and infantry divisions follow the standard PLA triangular organization, consisting of three infantry or armored platoons to a company, three companies to a battalion, three battalions to a brigade and three brigades to a division. The division is comprised of

three mechanized infantry brigades, one tank brigade, one artillery brigade, one air defense brigade, one helicopter wing and a logistics unit directly subordinate to the corps. The division headquarters is composed of an engineer battalion, an electronic warfare battalion, a chemical defense battalion, the division headquarters itself (which is company sized), air defense units and a guard company for headquarters protection. The division's artillery, intelligence and aviation structure are taken from the U.S. Army's experimental Division 86 [3].

The major difference in the new structure as opposed to previous configurations is that there are now four Type 86 infantry fighting vehicles (IFVs) in each platoon instead of three. This provides the platoon command with its own vehicle, allowing, for the first time, elements such as a forward observer or engineering teams to be attached to the platoon. This enables the platoon to be the lowest tactical unit whereas before, this was at the company level. There are a total of 351 Type 86 IFVs in each division that are supported by an artillery brigade of 72 122mm self-propelled guns and a tank battalion of 99 main battle tanks. Type 89 armored command vehicles are liberally provided throughout the division down to the company level to provide command and control capabilities.

The Type 86 IFV, a copy of the Russian BMP-1, has been modified so that the existing 73mm low velocity gun turret is now replaced with the new Chinese one-man "universal turret" containing a 30mm chain gun [4]. The 30mm turret increases the vehicle's anti-armor capability by 2.5 times and significantly increases its survivability, with the removal of over 35kg of easily ignitable high explosives [5]. A standard BMP-1, when penetrated by a shaped charge, invariably blew apart at the weld seams [6]. The new 30mm turret also has greater depression and elevation to enable individual windows and mountainsides to be engaged. No new armor has been added, however, meaning that the Type 86 is still vulnerable to high-powered 7.62mm rounds on its sides as well as anti-armor rockets [7].

The other combat tracked vehicles in the division, other than the tanks, are based on the indigenous Type 85/89 armored fighting vehicles. The support company of the battalion consists of one 100mm mortar company with 10 vehicles, with one mortar per vehicle and a single fire control vehicle; an automatic grenade launcher (AGL) platoon with two vehicles, each equipped with two AGLs; one anti-tank platoon of two vehicles sharing three anti-tank guided missile systems. There are 18 Model 85 series armored vehicles in each brigade providing 54 anti-tank guided missile systems in the division. There is an air defense platoon of three vehicles with four missiles per vehicle for a total of twelve. A division has 27 air defense vehicles and

has 108 man-portable air-defense systems (MANPADS) available for air defense at any time. They come under the operational control of the air defense brigade.

In line with the lighter vehicles, the divisional air defense brigade is composed of one battalion of 24 towed 57mm anti-aircraft guns and one battalion of 18 towed twin 37mm anti-aircraft guns. An air defense platoon of six Model 95 self-propelled anti-aircraft guns and one light surface-to-air missile launcher are attached to the artillery brigade. A new addition to the division is a helicopter wing with one squadron of six Z-9G attack helicopters and one transport squadron of six Mi-17 helicopters. These are lighter units that are likely to be augmented for operations. Logistics are provided by corps assets that are attached to the battle groups as required.

The vehicles and weapons in the new mechanized division are lighter than those in other PLA mechanized units, reducing their logistical footprint and providing tactical mobility, allowing for more roads and bridges to be used during operations. Lighter units are also more easily refueled and resupplied. On the few good roads in the rural regions of Xinjiang and Tibet, the ability to operate for extended periods is an invaluable advantage. Presently, only wheeled armored fighting vehicles operate in Tibet; tracked IFVs armed with 30mm automatic cannons and heavier support weapons would greatly assist these forces in the event of a widespread insurgency or an attack by Indian forces.

Heavier forces that might be utilized to augment the new division have also been developed. Support units drawn from the Beijing MR Command, including the Sixth Armored Division, have a structure similar to that of the mechanized infantry division. Its company structure is the same as the tank brigade in the new mechanized infantry division. There are two tanks at the battalion headquarters whereas in the mechanized infantry battalion tank brigade there are none. There are therefore 35 Type 88B or Type 99 main battle tanks per battalion and 105 main battle tanks per brigade.

Supporting artillery brigades are equipped with 72 152mm Model 83 self-propelled guns and the new PLZ45 155mm self-propelled gun that is being introduced into PLA service. The latter is capable of firing the Chinese built version of the Russian KBP laser guided round. The air defense brigade has a battalion of 24 57mm towed anti-aircraft guns and one mobile surface-to-air missile launcher. Anti-armor capability can be augmented by an anti-tank regiment, which is more of a small battalion in size, and contains six PTZ89 120mm self-propelled guns and 18 Red Arrow 8 anti-tank guided missile launchers. These are light enough

to supplement the mechanized division in isolated areas.

The PLA's new mechanized infantry division is undoubtedly well suited for operations in Xinjiang and Tibet, given the lighter footprint of the vehicles as well as the simpler logistics requirements as opposed to those of heavier armored units. Moreover, given its building block capabilities, the PLA would be able to tailor such a force based upon the needs of the operations. In contingencies that require heavier forces, such as a coup in Astana that threatens to disrupt energy supplies or the ascendancy of a regional government friendly to the Uyghurs, China would be able to quickly enter into the respective region and secure its critical strategic interests.

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NOTES

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