

of various factions are preoccupied with pushing the promotion prospects of their protégés. Even assuming that Wen is totally committed to resuscitating reform, the odds that the 68-year-old premier—who appears to be a minority of one within the CCP's top echelon—can do much in this regard are slim.

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China's Evolving Anti-Access Approach: “Where's the Nearest (U.S.) Carrier?”

By Andrew S. Erickson

China's military planners covet the ability to prevent U.S. and allied forces from intervening effectively in the event of a future Taiwan Strait crisis and to constrain the latter's influence on China's maritime periphery, which contains several disputed zones of core strategic importance to Beijing. In order to achieve the aforementioned goals, the People's Liberation Army (PLA) has been pursuing a two-level approach to military modernization, with consistent focus on increasingly formidable high-end ‘anti-access/area denial’ (A2/AD) capabilities to support major combat operations in China's ‘Near Seas’ (Yellow, East, and South) and their approaches, and relatively low-intensity but gradually growing capabilities to influence strategic conditions further afield (e.g., in the Indian Ocean) in China's favor.

In July-August 1995 and March 1996, concerns about Taiwanese President Lee Teng-hui's measures that Chinese leaders associated with moves toward *de jure* independence of Taiwan led Beijing to conduct missile tests and other military exercises near the Strait. To deter further escalation, then U.S. President William Clinton dispatched two carrier strike groups (CSGs) toward the region in March 1996, later remarking, “When word of crisis breaks out in Washington, it's no accident the first question that comes to everyone's lips is: where is the nearest carrier?” [1]. In the unfortunate event of a future U.S.-China military crisis,

however, it is Chinese leaders who would be asking where the nearest U.S. carrier is, albeit for the opposite reason.

Since 1996, China has methodically developed and acquired the technologies that could hold U.S. and allied military platforms and their supporting assets at risk in the Western Pacific [2], thereby positioning China on the affordable end of any asymmetric arms races. This matches Beijing's larger ‘active defense’ military doctrine, which is based partially on ‘non-linear, non-contact and asymmetric’ operations. Non-linear operations involve launching attacks from multiple platforms in an unpredictable fashion that range across an opponent's operational and strategic depth. Non-contact operations entail targeting enemy platforms and weapons systems with precision attacks from a distance sufficient to potentially preclude the enemy from striking back directly. Asymmetric operations involve exploiting inherent physics-based limitations to match Chinese strengths against an opponent's weaknesses [3].

At present, China's submarine-focused navy and still-limited air and naval aviation forces can only support a more limited strategy of sea denial and offensive counter-air as opposed to outright control. This A2/AD strategy is ever-more-potent, however, thanks to a vast and growing inventory of short-range ballistic and cruise missiles deployed in coastal units and on a variety of air, surface, and undersea platforms. The PLA is improving rapidly in many areas, and has manifold advantages on which to draw, particularly in its proximity to, and focus on, the most likely scenario—a multi-vector PLA offensive to pressure Taiwan into reunification.

POTENTIAL GAME CHANGERS

In addition to widespread incremental improvements, China is on the verge of achieving several paradigm-shifting breakthroughs: anti-ship ballistic missiles, or ASBMs; streaming cruise missile attacks; precise and reliable indigenous satellite navigation, high quality real time satellite imagery, and target-locating data; and anti-satellite (ASAT) and other space-related weapons, which might be used to disrupt U.S. access to information, command and control, and ability to remotely control weapons. Such achievements promise to radically improve China's A2/AD capabilities by allowing it to hold at risk a wide variety of surface- and air-based assets were they to enter strategically vital zones on China's contested maritime periphery in the event of conflict.

Of perhaps greatest concern, Beijing is pursuing an ASBM based on the DF-21D/CSS-5 solid propellant medium-range ballistic missile. A DF-21D ASBM would have two stages, and a reentry vehicle (RV) with a seeker, control

bins and a warhead (unitary, submunitions, or conventional electro-magnetic pulse). In operation, some combination of land-, sea- and space-based sensors would first detect the relevant sea-surface target. While locating an aircraft carrier has been likened to finding a needle in a haystack, this particular ‘needle’ has a large radar cross section, emits radio waves and is surrounded by airplanes. Simply looking for the biggest radar reflection to target will tend to locate the largest ship—and the largest ship will usually be an aircraft carrier. The ASBM would be launched from a transporter-erector-launcher on a ballistic trajectory aimed roughly at the target, most likely a CSG. After jettisoning its stages, the RV would use its seeker (possibly radar-homing or infrared) to locate and attack the CSG. This could be supplemented by targeting updates if necessary. The DF-21D’s 1,500 km+ range could result in denial of access to a large maritime area, far beyond Taiwan and the First Island Chain into the Western Pacific.

Admiral Robert F. Willard, Commander, U.S. Pacific Command, recently stated in Tokyo: “To our knowledge, [China’s ASBM] has undergone repeated tests, and it is probably very close to being operational” (*Asahi Shimbun*, August 24). What sort of ASBM “tests” China is conducting remains unclear, but the sequence and convergence of multiple factors suggest that some form of flight tests may be useful and important for deploying such capabilities. While system components may be tested separately, and on the ground in many cases, a fully integrated flight test is likely to be necessary to give the PLA confidence in approving full-scale production and deploying ASBMs in an operational state. If and when the DF-21D is developed sufficiently, particularly during a time of strategic tension or crisis, Beijing might reveal a test to the world—with or without advance warning—in some way geared to influencing official and public opinion in the United States, Taiwan, Japan, and elsewhere in the Asia-Pacific [4]. Alternatively, unpublicized flight tests could be conducted to deter foreign militaries without alarming foreign publics (though information might ultimately reach them regardless). The fact of a hit, however manipulated and revealed, could change the strategic equation that planners on the both sides use in making difficult decisions.

China has a clear and compelling strategic rationale, sufficient resources (from the world’s second largest *official* [emphasis added] defense budget at \$78 billion), and the requisite technological expertise (having prioritized ballistic missiles and related infrastructure since the late 1950s) to progress rapidly in ASBM development. Patterns in a wide variety of open source publications offer indications that this is in fact occurring. China may already be producing DF-21D rocket motors, having reportedly completed a purpose-built factory in August 2009 [5]. Likewise important is the recent launch of multiple advanced *Yaogan*

surveillance satellites for a total of 11 in operation, three of which were apparently placed in the same orbit on March 5 (See “PLA Expands Network of Military Reconnaissance Satellites,” *China Brief*, August 19). Another possible indication is a recent news release attributed to China Aerospace Science & Industry Corporation citing Wang Genbin, deputy director of its 4th Department, as stating that the DF-21D can now hit “slow-moving targets” with a circular error probability of (meaning half of missiles fired will strike within) dozens of meters [6]. Retired Lieutenant Colonel Mark Stokes, USAF, and Tiffany Ma hinted that the Second Artillery may be constructing its first ASBM missile brigade facilities (Unit 96166) in the northern Guangdong Province municipality of Shaoguan (*AsiaEye*, August 3). A recent *Global Times* editorial goes so far as to advocate that to end “speculation” by Western intelligence agencies, “China ought to convince the international community of its reliable carrier-killing capacity as soon as possible” and “should also let Westerners know under what circumstances will such weaponry be used” (*Global Times* [English edition], September 6).

An ASBM system of systems, if developed and deployed successfully, would be the world’s first weapons system capable of targeting a moving CSG hundreds of kilometers from China’s shores from long-range, land-based mobile launchers. This could pose a new type of threat to the U.S. Navy qualitatively different from that of, for example, anti-ship cruise missiles (ASCMs). Unlike with ASCMs, the United States has not had decades to address the new challenge; interception is far more complex and time sensitive; and, even assuming that they can be located with confidence, highly concealable land-based launch platforms or supporting C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance) infrastructure cannot be targeted without contemplating highly escalatory strikes in mainland China.

TRACKING A MOVING TARGET

Central to maximizing Beijing’s ability to employ ASBMs and related systems will be effective utilization of ISR, the collection and processing of information concerning potential military targets. An emerging network of space-based sensors promises to radically improve the targeting capabilities of China’s Navy and other services with which it may operate, for example, the Second Artillery.

China’s satellite capabilities, while far from cutting-edge in many respects, are improving rapidly. China today has only a fraction of the overall space capability of the United States, still has major gaps in coverage in every satellite application and relies to a considerable extent on technology acquired through non-military programs with

foreign companies and governments. China will likely purchase commercial imagery products to supplement its current surveillance capabilities until it is able to deploy a more advanced set of reconnaissance satellites in the coming decade. Such a capability could greatly improve China's ability to monitor force deployments on its periphery. Beijing is combining foreign knowledge with increasingly robust indigenous capabilities to produce significant advances of its own. China's satellite developers are experimenting with a new workplace culture that emphasizes modern management, standardization, quality control, and emerging mass production ability. China has developed a full range of military, civilian and dual-use satellites of various mission areas and sizes.

Improvements in access to foreign and domestic navigation-positioning systems increase the accuracy of Chinese missiles and other position-dependent equipment, and development of a viable independent system could improve Chinese access to reliable signals in conflict. China's current four-satellite *Beidou-1* constellation, deployed in 2007, is limited to supporting operations on China's immediate maritime periphery and providing navigation coverage accurate to within about 20 m. To reliably support broader operations, China is deploying a 35-satellite (5 geostationary, 30 medium earth orbit) constellation—called *Beidou-2/Compass*—that would provide much-improved accuracy, with regional navigation and communications coverage anticipated by 2011 and global navigation coverage by 2015-20 [7]. Four satellites have been launched thus far.

Given their potential for high resolution and accuracy, satellites will enhance Chinese ISR capabilities. China's imaging satellites with sufficient resolution to play a role in detecting and tracking a CSG are currently inadequate for continuous satellite coverage based on revisit times for specific ocean areas. China may, however, launch sufficient satellites to achieve coverage regionally (8-12 civilian, plus additional military) by 2015 and globally (a further 8-12 civilian, plus additional military) by 2020 [8]. Even before then, China's emphasis on small satellites and small solid-fueled rockets may allow it to achieve a satellite surge capability. China's low-cost launchers (e.g. *Kaituozhe*) may offer a combination of rapid turnaround and efficiency. The upgrading of Wenchang Satellite Launch Center, China's fourth, indicates a commitment to cutting-edge infrastructure [9].

CONCLUSION

Emerging Chinese A2/AD capabilities should concern not only the U.S. Navy but also the U.S. military as a whole, whose operations in East Asia writ large could be affected.

Similar challenges threatening to hold U.S. platforms at risk in vital areas of the global maritime commons are emerging in the Persian Gulf and might eventually materialize elsewhere.

Ongoing Chinese limitations include deficiencies in human capital, realism of training, hardware and operations, C4ISR, and real-time data fusion, as well as uncertainties on China's part about the extent to which it can detect targets and achieve geographical and temporal fires deconfliction with existing systems and strategies. Chinese ASBM development in particular faces serious challenges, e.g., in the areas of detection, targeting, data fusion, joint service operations, and bureaucratic coordination. A senior U.S. Department of Defense official recently indicated that, "the primary area ... where we see them still facing roadblocks is in integrating the missile system with the C4-ISR. And they still have a ways to go before they manage to get that integrated so that they have an operational and effective system" [10].

Yet China has many ways to mitigate limitations for kinetic operations around Taiwan or other areas of its maritime periphery and potentially for non-kinetic peacetime operations further afield. The PLA can augment C2 and target deconfliction by employing landlines, high-power line-of-sight communications, advanced planning, and geographic and temporal segregation. Its strength is relative to its objective, and here China may be extremely capable of achieving its specific goals. China need not keep pace with the U.S. technologically for its incremental developments to have disproportionate impact. The U.S. is inherently exposed because it operates offensively on exterior lines, and must struggle to maintain technological superiority to reduce this vulnerability.

China's diverse, rapidly-evolving, interactive C4ISR architecture remains different than that of the U.S., even as it increases in coverage and sophistication. To reach the next level of capability in safeguarding China's core interests, the PLA has to be able to locate a CSG on the ocean, but only in regions from which the CSG can strike China, and that is necessarily different from what the U.S. military has to do. Given the Chinese Navy's cultivation of a maritime militia and civilian vessels, and the PLA's apparent emphasis on cyber capabilities, it is not inconceivable that at least some rudimentary targeting data might be obtained via unconventional means. These factors suggest that U.S. analysts must not 'mirror image' when assessing China's ISR targeting capabilities or assume that satellite capabilities are themselves definitive.

A2/AD affords China a strategic defensive posture along interior lines. Overall U.S. qualitative, and even numerical,

superiority in advanced platforms and systems is of limited relevance for two reasons. First, the platforms most likely to be employed are those that are based within immediate striking distance at the outbreak of conflict; here China inherently enjoys theater concentration, while U.S. platforms are dispersed globally. Second, aircraft sent to the theater needs airfields from which to operate; here U.S. regional options are limited geographically and politically, and are vulnerable to Chinese missile attack.

While conflict is by no means foreordained, and interaction and cooperation should be pursued whenever feasible and equitable, the challenge presented by China's emerging A2/AD infrastructure cannot be ignored. Long before a crisis, and to deter one from ever erupting, U.S. leaders need to ask, "Where are *threats* to our carriers, and how can we counter them?"

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NOTES

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China's Emerging Debate on Military Transparency

By Isaac B. Kardon

A reconsideration of traditionally skeptical attitudes about military transparency appears to be underway in China. Whereas Beijing formerly rejected Western calls for greater military transparency—arguing that transparency benefits the strong at the expense of the weak—a new calculus seems to be emerging that reflects China's greater confidence in its own strength. As Chinese military capabilities have improved in both relative and absolute terms, the same logic that justified wariness of military transparency now recommends it as a useful tactic. Recent comments by Chinese officials and experts, along with some adjustments to military practice, suggest that greater transparency is now seen as an instrument capable of serving useful political and deterrent functions.

China's interpretation of transparency nonetheless remains conditional and selective, elevating optics and public relations above substantive disclosures. Indeed, the Chinese practice of military transparency is marked by its omissions. Rather than embracing transparency as an end in itself, the PLA selectively addresses foreign demands for greater transparency without necessarily "providing information about military capabilities and policies that allow other countries to assess the compatibility of those capabilities with a country's stated security goals" [1]. The subsequent analysis of some recent statements and behaviors provides insight into how the risks and rewards of increased military transparency are portrayed within China, offering some indication of likely PLA practices in the future.

CHINESE MILITARY TRANSPARENCY IN CONTEXT

Beijing has traditionally viewed Western calls for greater military transparency as an indirect way to disadvantage a less capable Chinese military. Weaker states, they reason,