

**Testimony before the U.S.-China Economic and Security Review Commission**  
**Hearing on China's Military Modernization and its Implications for the United States**

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One way to analyze the implications of China's military modernization for the United States is to consider how China would use its military capabilities in a conflict with the United States. This, in turn, would depend on the nature of the conflict. A conflict over minor interests would likely entail limited commitments of force and lower levels of escalation, while a conflict over issues that threatened China's national survival could potentially entail the commitment all of China's military forces and unlimited levels of escalation.

**How China's Military Capabilities Might Be Employed in a Conflict with the United States**

A conflict over Taiwan is one of the more likely scenarios for armed conflict between the United States and China and, given the stakes involved for the Chinese leadership, would probably entail large-scale force commitments and high, but not unlimited, levels of escalation.

Examining a hypothetical conflict over Taiwan, therefore, can provide insights into how China's military capabilities could impact the United States.

Although a variety of conflicts over Taiwan are imaginable, a Chinese attempt to invade the island would involve the fullest range of forces and operations. A 2006 textbook on military campaigns, *Campaign Studies* 《战役学》,<sup>1</sup> published by China's National Defense University, describes a generic approach for conducting amphibious invasions. Although an invasion of Taiwan would undoubtedly differ in some of the details from what is described in *Campaign Studies*, the main elements described in *Campaign Studies* are probably broadly accurate.

According to *Campaign Studies*, an amphibious landing campaign would consist of three main phases: initial operations in preparation for the landing, embarking the invasion forces and transporting them across the water, and landing them on the beach and establishing a beachhead. The preparatory operations would include seizing information superiority, air superiority, and sea control; neutralizing enemy defenses in the area where the landing would be conducted; and clearing mines and obstacles in the landing zone. Once the preparatory operations were complete, the invasion force would move to its embarkation ports, be loaded onto amphibious transports, and sail to the landing beaches. During this time the Chinese military would need to continue to maintain information superiority, air superiority, and sea control. When the invasion force arrived at the landing beaches, it would disembark, neutralize any enemy ground forces in

the landing area, defeat any counterattacks on the beachhead, and expand the beachhead as rapidly as possible. As additional forces were added to the beachhead, eventually the invasion force would break out of the beachhead and seek to conquer the entire island.<sup>2</sup>

Seizing information superiority, air superiority, and sea control is said to entail neutralizing a variety of targets including enemy command and control centers, communications hubs, information processing facilities, information warfare centers, radar emplacements, surface-to-air missile and anti-aircraft artillery batteries, air bases, navy bases and commercial ports, surface-to-surface missile emplacements, coastal defense missile emplacements, warships in port, munitions depots, aircraft, surface ships, and submarines. It would also entail defending against such attacks by the adversary. Means by which such targets can be neutralized or defended are said to include ballistic missiles, cruise missiles, aircraft, surface ships, submarines, and surface-to-air missiles, as well as electronic warfare and computer network operations.<sup>3</sup>

In the case of an invasion of Taiwan, the question is who “the enemy” would include. That is, would China attack the types of targets listed above only if they belonged to Taiwan, or would it also attack such targets that belonged to the United States? My view is that, if the Chinese leadership believed that they could win a war for Taiwan without physically attacking U.S. bases and facilities in the region, they might attempt to do so and thus limit their attacks to U.S. aircraft in the air and ships at sea that were intervening in the defense of Taiwan. If, however, Chinese leadership came to believe they could win without physically attacking U.S. bases and facilities in the region (or if the U.S. began attacking targets in mainland China), then they would expand the scope of their attacks to include any bases and facilities in the region out of which U.S. combat forces were operating. In what follows, therefore, I assume that the Chinese leadership has determined that it cannot successfully conquer Taiwan without attacking U.S. bases and facilities in Japan, Guam, and any other territories in the region, as well as U.S. assets in space.

*Campaign Studies* and other authoritative Chinese publications on military operations that have been analyzed are not specific about the order in which targets would be attacked or with what types of assets.<sup>4</sup> However, the logic of these publications and circumstantial evidence suggest that efforts to electronically infiltrate U.S. and Taiwanese military and civilian information systems would be underway well before the commencement of combat operations. Combat operations would then begin with the triggering of malware designed to disable, disrupt, or corrupt U.S. and Taiwanese information systems, along with the use of jammers and lasers to disrupt or blind U.S. and Taiwanese radars, surveillance satellites, and other sensors; the launching of direct-ascent antisatellite missiles against U.S. surveillance satellites; the launching of a barrage of ballistic missiles at U.S. and Taiwanese missile and air defense systems, air bases, and any warships within range of China’s antiship ballistic missiles; and attacks on key targets – such as early warning radars, air traffic control facilities, underground cables and pipelines or above-ground switching facilities and fuel manifolds – by covert operatives infiltrated in advance (potentially months or even years in advance) into Taiwan, Japan, and Guam.

Cruise missiles and aircraft with precision-guided munitions such as laser- and satellite-guided bombs and air-to-surface missiles would then be used to attack “point targets” that the ballistic missiles lacked the ability to destroy with a high probability. Such targets would include hardened aircraft shelters, radar installations, command posts, communications hubs, aviation fuel storage and distribution facilities, aircraft repair and maintenance facilities, and munitions depots.

The Chinese military would also look for opportunities to attack U.S. aircraft carriers – a key element of the U.S. ability to contest air and sea superiority around Taiwan – with antiship ballistic missiles, submarine-launched torpedoes and cruise missiles, land-based aircraft,<sup>5</sup> and surface ships with anti-ship cruise missiles.

The net effect of these attacks on the U.S. ability to defend Taiwan would likely be substantial. By 2020 China will have significant numbers of medium-range ballistic missiles and land-attack cruise missiles capable of reaching any of the U.S. facilities in Japan, which are the closest to Taiwan. The ballistic missiles could be used first to overwhelm and destroy the majority of land-based air and missile defenses in Japan, to destroy aircraft parked in the open or in unhardened hangars at air bases, and to damage runways to prevent aircraft from taking off or landing. Cruise missiles and long-range land-based aircraft with precision-guided munitions could then be used to destroy aircraft parked inside of hardened shelters and other key facilities. The net result would likely be the destruction on the ground of a large proportion of U.S. combat aircraft based in Okinawa and the main islands of Japan and significant damage to other key U.S. facilities in Japan.

U.S. aircraft carriers operating in the Western Pacific would be at risk as well. Much attention has been given to China’s development of an antiship ballistic missile, but U.S. carriers would face other hazards that could be even more severe. Carriers operating within about a thousand miles of China’s coast, for example, would also be subject to attack by land-based Chinese Su-30 and J-11B fighters, JH-7 supersonic fighter bombers, and H-6 bombers, all of which can be armed with antiship cruise missiles. Although U.S. carrier strike groups are specifically designed around defending the carrier against this kind of attack, the sheer numbers of these aircraft China will likely have by 2020 – probably several hundred J-11s and JH-7s – mean that at least some attacks would be likely to succeed. And even if they did not succeed, the carriers might be so consumed with defending themselves that they would not be able to use significant numbers of their aircraft for defending Taiwan.

Another hazard for U.S. aircraft carriers operating close to China would be China’s submarines. Although the majority of China’s submarines will continue to be slow, diesel-powered boats for the foreseeable future, by 2020 most or all of these will be armed with antiship cruise missiles, including eight “Kilo” class submarines equipped with the long-range, supersonic, sea-skimming Klub system. The slow speed of China’s diesel submarines would mean that a U.S. carrier would essentially have to run one over for the submarine to get a torpedo shot off, but a carrier

strike group coming within missile range of one or more submarines would be a much more likely event.

Most of China's air-launched and submarine-launched antiship cruise missiles will be subsonic in 2020, and thus relatively easy for the strike group's air defenses to intercept, but if even one missile from a salvo penetrated the strike group's defenses, it would make for a very bad day for whatever ship it hit. Even a Nimitz-class carrier, although unlikely to be sunk by just one or two such missiles, could nonetheless be put out of action if the missile struck at the waterline and caused the carrier to be unable to steam at the speeds required for aircraft launch and recovery.

One response to this combination of threats would be to operate U.S. land-based and carrier aircraft from locations farther away from China. For land-based aircraft, the only significant U.S. base outside of the range of China's medium-range missiles but still relatively close to Taiwan is Andersen Air Force Base at Guam. For aircraft carriers it would mean staying at least a thousand miles away from China's coast.

There are two main disadvantages to this approach. First, the amount of airpower that could be projected over Taiwan and China from such locations would be significantly less than from other locations. If operating out of Okinawa, for example, which is about an hour's flight time away from Taiwan, each fighter aircraft could probably fly about two four-hour combat air patrols a day. That would make each mission six hours long, including flight time to and from station, and leave six hours between each mission to refuel and rearm the aircraft and perform required maintenance. From Guam, by contrast, transit time would be about four hours each way. If the fighter still spent four hours on station, each flight would require a total of twelve hours. Required maintenance time between flights tends to go up in proportion to the length of the flight, so each fighter would only be able to fly about one sortie per day. As a result, the number of fighters that could be kept in the air over Taiwan would be roughly halved when flying from Guam as compared to Kadena. Carrier aircraft would be similarly affected if forced to fly from carriers more than a thousand miles from China, as opposed to steaming in waters closer to Taiwan.

The second disadvantage to long-range fighter operations is that fighters cannot carry enough fuel to fly all the way to Taiwan from Guam or a carrier more than a thousand miles off of China's coast, so they have to be refueled en route by tanker aircraft. It turns out that it would take nearly one tanker aircraft in Guam to support each fighter aircraft based there. Although Andersen is a very large base, there is a limit to how many total aircraft it could handle at one time and thus to how many fighters could viably operate from it. In the case of carrier-based aircraft, the situation could be even more difficult, depending on where the carriers were operating. Overall, a huge and potentially vulnerable logistical effort would be required to provide the aviation fuel needed to sustain long-range fighter operations.

Over the longer run an additional challenge is likely to arise: China is believed to be developing intermediate-range conventional ballistic missiles and bomber aircraft capable of reaching Guam. When that happens, Guam will no longer be invulnerable to attacks from mainland China.

Even if Guam remains safe for the time being, if China can succeed in halving the number of aircraft the U.S. can keep in the Taiwan area at any given time, then China's ability to achieve air superiority in the area will have essentially doubled. Once air superiority is achieved, moreover, achieving sea control around Taiwan becomes easier, as U.S. and Taiwanese surface ships will be vulnerable to attack from the air. And if air superiority and sea control can be achieved, then China will be in position to launch an amphibious invasion of Taiwan.

Amphibious invasions are always highly risky operations and this one would be no exception. First, although China might be able to maintain air superiority over Taiwan most of the time, the United States could nonetheless put a large number of aircraft into the air for a short period of time to launch attacks on China's invasion fleet as it made the more-than-ten-hour journey to Taiwan from ports on China's coast. Second, although China might control the surface of the sea around Taiwan, its ability to find and sink U.S. submarines will be extremely limited for the foreseeable future. Those submarines would likely be able to intercept and sink Chinese amphibious transports as they transited toward Taiwan. Each submarine would only be able to get off a few torpedo shots, however, before it would need to withdraw for self-preservation, as the launching of the torpedoes would disclose its presence. Whether these attacks would be sufficient to thwart the invasion, therefore, is unclear.

Many of the Chinese capabilities and operations described above could be employed in other conflicts involving the United States, such as an attempt to seize control of the islands called the Senkaku by Japan and Diaoyu by China or to seize control of Philippine-held islands in the South China Sea, so the Taiwan scenario is by no means a special case. Although I have little doubt that the United States would come to the defense of Taiwan or its treaty allies in conflicts like the ones described here, the capabilities that China is acquiring and the geography of the region mean that there is a legitimate possibility that the United States could be defeated in a conventional war, something that has not been true for over a quarter century. Recognition of this reality could cause countries in the region to question whether the United States is willing and able to uphold its security commitments in Asia.

### **How the United States Should Respond**

How should the United States respond to this growing challenge? There are those who say that China's leadership would never resort to the use of force, as it would disrupt the economic growth on which their legitimacy is based, and therefore that there is no need to respond to China's growing military capabilities. My concern is that there could come a day when that was no longer true. That is, a leadership group whose legitimacy rested on achieving nationalistic goals more than economic growth could someday come to power in China. Even China's current

leadership, if economic growth stalled, could find its hold on power under threat and feel compelled to respond forcefully to perceived provocations from outside of China.

There are also those, including a surprising number in the U.S. Defense Department and military services, who say that Taiwan, much less the Senkaku or Spratly Islands, is simply not worth a confrontation with China over. They point out that China has nuclear missiles capable of reaching the United States and that in any case China is more important to the U.S. economy and security than are Taiwan, Japan, or the Philippines, and therefore there is no need to respond to China's growing military capabilities. I disagree. The United States has both a moral and a material interest in a world in which democratic nations can survive and thrive. Backing away from our commitments to protect Taiwan, Japan, or the Philippines would be tantamount to ceding East Asia to China's domination. The act itself would signal to all in the region that the United States had ceded it to China. In the process we would weaken or discredit our alliance with Japan, one of our most important economic and security partners not just in Asia but throughout the world. Such a choice would make U.S. interests less secure, not more so.

I believe, therefore, that the proper response to China's growing military capabilities is to take steps to ensure that the United States maintains the capability to prevail in the event of a conflict with China in the western Pacific region. I will not speak here of specific systems or strategies that should be developed, although I have done so elsewhere,<sup>6</sup> but instead give my views about the overarching principles that should inform the U.S. response.

Let me begin with several observations. First, the huge technological edge the U.S. military has enjoyed over China is eroding. This is the result of China's rapid economic growth and integration into the world economy, ever-increasing defense spending in China, and the "follower's advantage" that results from the fact that it is easier to imitate the technological successes of others than to develop fundamentally new technologies. By my estimates, in 2020 the weaponry of China's military forces will be roughly comparable to that of the U.S. military in 2000. One way to look at that is to say that even in 2020 China's military will still be 20 years behind the U.S. military. Another way to look at it, however, is to ask how much more advanced the U.S. military will be in 2020 as compared to 2000.

A second observation is that, after a decade in which U.S. defense spending more than doubled, it is not realistic to think that we can overcome the challenge of China's growing military capabilities by throwing additional money at it. U.S. federal budget deficits, grassroots opposition to government spending, and the winding down of the wars in Iraq and Afghanistan – and hopefully the winding up of no new wars – mean that U.S. defense spending is not likely to significantly increase for the remainder of the decade. Responding to the challenge presented by China's growing military capabilities will require new ways of making use of current funding levels, not solutions that depend on increased defense spending.

A third observation is that, in potential conflicts with China, quality of weaponry is more important than overall quantity. In the case of aircraft, given the limited amount of basing capacity available to the United States in the western Pacific region and the finite capacity of aircraft carriers, it is better to have one high performance fighter than two medium-performance ones. In the case of ships, it is better to have one highly-capable ship based in the Pacific than two less-capable ships split between the Pacific and Atlantic. This means that it is essential to provide our forces with new and more advanced weapon systems as they come available, and to continue to upgrade the systems we already have, even if that means we can afford fewer of them.

A fourth observation is that quality weaponry is useless without the infrastructure to support it. This means air bases that are able to handle large numbers of aircraft, have hardened shelters to protect the aircraft operating there, and rapid repair capabilities to restore flight operations after an attack; it means aerial refueling aircraft and underway replenishment ships; it means maintenance and repair facilities and storage depots; and it means the communications and transportation networks to connect all of them together.

A fifth observation is that software is more important than hardware. The true U.S. advantage comes not from our high-tech weaponry but from the organization, people, training, and culture of our military. Here too, however, our advantage is eroding. The training of the Chinese military improves year by year and, according to my analysis, by 2020 the average Chinese soldier will be better educated than his or her American counterpart. To maintain our qualitative edge over China we not only need more advanced weaponry and better infrastructure, we also need to ensure that our military organizations are flexible and responsive, that the services are recruiting and retaining the best people and giving them the best training and education, and that they are fostering a culture based on performance and initiative, not one of caution and conformity.

How can we maintain our qualitative edge over China and strengthen our military infrastructure in an era of constrained defense spending? I see no alternative to cutting the size of our forces.

Current U.S. force structure is still largely based on a two-regional-wars standard developed during the 1990s. This standard posited that the United States should maintain the capability to conduct two nearly-simultaneous wars on the scale of 1991's Operation Desert Storm against Iraq. The logic behind this standard was not that two such wars were likely to occur simultaneously by chance, but that, if one such war occurred, the United States would want to have the capability to deter potential aggressors not involved in the first war from taking advantage of the fact that U.S. forces were tied down in the first war by launching or threatening aggression elsewhere. The justification for the U.S. force structure has evolved since the 1990s, but the force structure itself has remained largely the same.

Unfortunately, while the two-war requirement was reasonable and feasible when the wars in question would have been with regional powers such as Iraq or North Korea, it is not feasible

when one of the wars would be with a global power such as China is becoming. Maintaining the capability to prevail over China at current budget levels will require the reduction of U.S. force structure to a level such that we could not simultaneously both fight China and conduct another Desert Storm-type operation.

Reducing the size of U.S. force structure will also limit U.S. capacity to deploy forces abroad in response to contingencies that require lower levels of force than Desert Storm but which require that the forces be deployed for longer periods of time. Current U.S. operations in Afghanistan would be one example but, even if the U.S. deployment to Afghanistan is significantly reduced or ended in the near future, there will still be a recurring need to deploy U.S. forces overseas. Before the terrorist attacks of 9/11, substantial U.S. forces were deployed for long periods of time to hot spots around the world such as the Balkans, the Middle East, and the Korean peninsula.

Note that the needed funds cannot be freed up through “efficiencies” like cutting headquarters staffs. The funding levels needed go far beyond what can be achieved through the pursuit of increased efficiency. There is also no way to obviate the need to free up additional modernization and infrastructure funds by developing innovative strategies or operational concepts. One of the things I was asked to do in my testimony was to give my assessment of Air-Sea Battle. This is a difficult question to answer because so little information about Air-Sea Battle is publicly available. As someone who has spent a considerable portion of his career analyzing this challenge, however, I can say that it is one that cannot be solved through simple, inexpensive fixes, and Air-Sea Battle does not appear to be making such claims either. Countering China’s military capabilities and geographic advantages will require the development not only of new concepts of operations but also, in order to implement those concepts, of capabilities and facilities that are different from the ones we have been investing in for the past two decades.

I have not done the analysis to say exactly how much should be cut or from where, but I am certain that cuts will need to be made. Some funds can perhaps be freed up by not acquiring systems that are less essential to the missions the U.S. military will need to be able to conduct in coming years, but these will not be enough. Roughly two-thirds of the base defense budget (not including overseas contingency operations) goes to pay for the personnel and operation and maintenance costs of our standing forces, with virtually all of the remainder going to pay for their ongoing modernization. If we want to maintain our technological advantage over China we will need to spend more on modernization, not less. The only way to do so, without increasing the overall defense budget, will be to reduce the amount we spend in those other two budget categories. If we simply pay our troops less, however, we will get less-talented people. If we spend less time operating and maintaining the forces, they will be less-well trained and equipped. The only other way to reduce personnel and operation and maintenance costs is to reduce the overall size of our forces.

Having to reduce the size of our forces is unfortunate and will impact the ability of the United States to keep military units present in various potential hotspots around the world, but it is simple reality. The good news is that the forces that remain will be more than sufficient in number for any plausible conflict with China. Even at this reduced size, moreover, if the United States were to become involved in a war in one part of the world (e.g., with China), the forces that were not committed to that conflict, though not as large as those that so easily defeated Iraq in 1991, would nonetheless be substantial and capable enough to cause any leader to think twice about trying to take advantage of U.S. commitment in one part of the world by threatening or launching a war somewhere else. Nonetheless, reducing the size of our military is always a difficult and painful thing to do.

We will soon learn if the latest Quadrennial Defense Review has made the tough choices that proper response to China's growing military capabilities requires. Given institutional inertia and the interests that are invested in the current U.S. force structure, however, I will be surprised if all of the needed choices are made. The likelihood that the Defense Department will take some but not all of the steps needed to respond to China's growing military capabilities raises the last issue I was asked to address, which is what policy recommendations I would present to Congress regarding China's military modernization and its implications for the United States.

My first recommendation, therefore, is, whatever cuts to force structure or acquisition programs the Department of Defense asks for, push them to make more. Ask them how each major force structure element and acquisition program they are intending to preserve contributes to our capability to respond to potential contingencies involving China. If the element or program does not contribute to our capability to respond to potential contingencies involving China, ask them to explain what other essential mission it does contribute to. If they cannot give a good answer to that question, then ask them, if that program were eliminated, how the funds used to support it could be used to increase our capability to respond to potential contingencies involving China.

My second recommendation is, where the Department *does* ask to make cuts to force structure or acquisition programs, the default position of Congress should be to support those cuts. That does not mean that the DoD will always make the right choices or that Congress should not scrutinize those choices, but, unless the force structure element or acquisition program being cut is clearly one that contributes to our ability to respond to potential contingencies involving China, Congress should give the DoD the benefit of the doubt. Virtually all DoD programs have value. The challenge is to ensure that the critical ones take precedence over the merely valuable.

Cutting forces and acquisition programs is not without cost. Some military personnel will have to leave the service and many communities and businesses are dependent on funds that come from military units and acquisition programs. As someone who lives in North Carolina, I come from a state that could be significantly impacted by a major reprioritization of defense spending. But the primary purpose of national defense is to protect the interests of the nation as a whole, not to support particular communities and businesses. If Congress and the Administration do not

make the vital but difficult choices required to ensure the Department of Defense's ability to protect those interests, then they will have let those communities and businesses down as much as the rest of the nation.

China's growing military capabilities are presenting the United States with a security challenge of a magnitude that it has not faced since 9/11. Like 9/11, moreover, this challenge is one that has been building for years and will likely to continue to grow in the future, but is not apparent to most Americans. Responding to this challenge, therefore, will take foresight and courage. Foresight to recognize that action is needed now, before a crisis has occurred, and courage to make fundamental changes in the absence of immediate and imminent danger.

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<sup>1</sup> Zhang Yuliang (张玉良), Yu Shusheng (郁树胜), Zhou Xiaopeng (周晓鹏), ed., 《战役学》, (Beijing: National Defense University Press, 2006).

<sup>2</sup> Zhang, Yu, and Zhou, 2006, pp. 316-330.

<sup>3</sup> Ibid.

<sup>4</sup> *Campaign Studies* describes the targets that would be attacked, but not the order in which they would be attacked or with what assets. A recent RAND study on Chinese air force operations (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 21<sup>st</sup> Century*, Santa Monica, Calif.: RAND Corporation, 2011) describes the likely sequence of operations and targets for the Chinese air force in an air superiority campaign, but has no information on how these would be coordinated with the actions of assets controlled by other services, such as the ballistic and cruise missiles operated by the Second Artillery Force.

<sup>5</sup> Given the threat posed by U.S. nuclear attack submarines and other dangers, this scenario assumes that the Chinese navy would, at least initially, keep its own carriers close to China's coast and on the periphery of the conflict where they would force the U.S. to devote assets to tracking their location and hedging against an incursion by them but limiting their vulnerability to U.S. attack.

<sup>6</sup> E.g., see Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, Kevin L. Pollpeter, *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, Calif.: RAND Corporation, 2007).